CULTURAL RESOURCES OF THE PROPOSED ROUTE 13 CORRIDOR: AN OVERVIEW PREPARED FOR THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

DELDOT ARCHAEOLOGY SERIES NO. 40

Edited by

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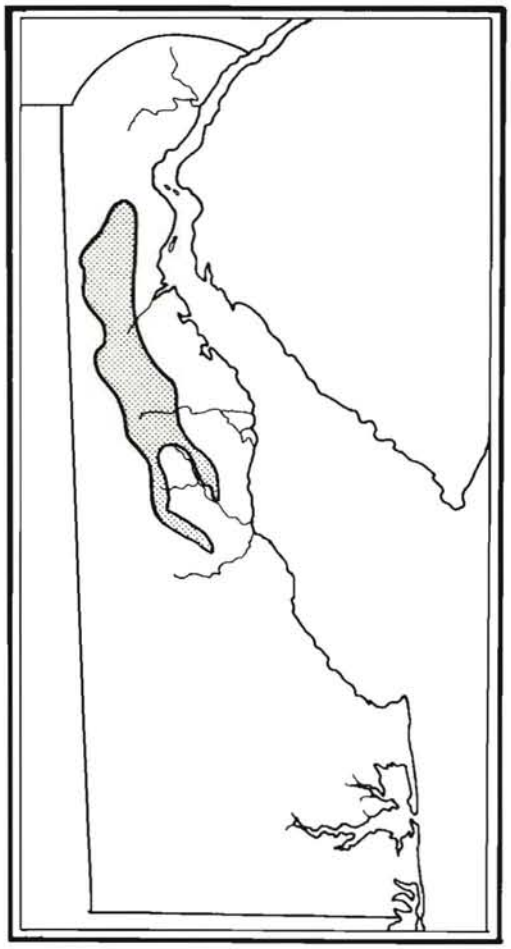
Center for Archaeological Research

DELAWARE DEPARTMENT OF TRANSPORTATION
Division of Highways
Location and Environmental Studies Office



U.S. Department of Transportation
Federal Highway Administration

Delaware Department of Transportation

John T. Davis
Director
Division of Highways
1986

CULTURAL RESOURCES OF THE PROPOSED ROUTE 13 CORRIDOR: AN OVERVIEW PREPARED FOR THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

DELDOT PROJECT 83-110-01 DELDOT ARCHAEOLOGY SERIES NO. 40

FHWA FEDERAL AID PROJECT F-1001 (16)

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Location and Environmental Studies Office

Submitted To

U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration

and

DELAWARE DEPARTMENT OF STATE
Division of Historical and Cultural Affairs
Bureau of Archaeology and Historic Preservation

Prepared For

DELAWARE DEPARTMENT OF TRANSPORTATION
Division of Highways
Location and Environmental Studies Office

John T. Davis
Director
Division of Highways

Doc. Con. No.
55-04/86/04/01

1986

PREFACE

This report has been prepared for the Federal Highway Administration and the Delaware Department of Transportation as supporting information for the Draft and Final Environmental Impact Statements (D.E.I.S. and F.E.I.S.) for the U.S. Route 13 Relief Route project in central Delaware.

The proposed project consists of a 58-mile limited access highway facility to provide sufficient traffic capacity to address problems existing in this corridor and traffic volumes anticipated in the next twenty years. The limits of the proposed project extend from Tybouts Corner on the north, where new Delaware Route 7 improvements are to terminate, to the Frederica and Felton areas south of Dover, including U.S. Route 113 and U.S. Route 13. The study area investigated is 58 miles in length and includes the areas approximately two to three miles to the east and west of the present U.S. Route 13.

This report is one of a series of technical reports which provide detailed supporting documentation for the summary discussions presented in the Draft and Final Environmental Impact Statements. A separate technical report will be prepared for each of the following topics:

* Project History
* Alternatives Report
* Preliminary Engineering Evaluation
* Traffic, Transportation and Energy Evaluation
* Socioeconomic and Land Use Evaluation
* Historical, Cultural and Archaeological Resources Evaluation
* Farmlands Evaluation

* Geology, Soils, Groundwater and Surface Hydrology Evaluation
* Terrestrial/Aquatic Resources and Water Quality Evaluation
* Wetlands Evaluation
* Air Quality and Noise Evaluation

Copies of these reports and associated project plans and information are avialable for the public's review during office hours at the Delaware Department of Transportation Division of Highways Offices on U.S. Route 113, south of Dover and at the Federal Highway Administration Offices, 300 South New Street, Dover, Delaware.

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Jay F. Custer and Kevin W. Cunningham

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University of Delaware

Delaware Department of Transportation
Division of Highways
Location and Environmental Studies Office

The U.S. Route 13 Relief Route project is a study of alternatives to relieve the present and projected traffic conditions on U.S. Route 13 in central Delaware. The proposed alternatives are for a 58-mile limited access facility highway extending from Tybouts Corner on the north, where new Delaware Route 7 improvements are to terminate, to the Frederica and Felton areas south of Dover, including U.S. Routes 13 and 113. The regional context of the proposed project area is shown in Figure 1, Project Location Map.

The project study area, shown in Figure 2, includes the areas 2 to 3 miles on either side of the existing U.S. Route 13 from Tybouts Corner at the northern end to the areas around Frederica and Felton along U.S. Routes 113 and 13 south of Dover. The area is characterized by farmland, forest, and wetlands with concentrations of residential, commercial, industrial, and public service uses in and around Dover, Odessa, Smyrna, and Middletown. The largest community and the main urban area within the study area is the Dover/Camden/Wyoming area, with a total population of over 61,000 people. It is also the most diverse of the communities in the study area with significant residential, commercial, industrial, and institutional development.

FIGURE 1

Project Location Map

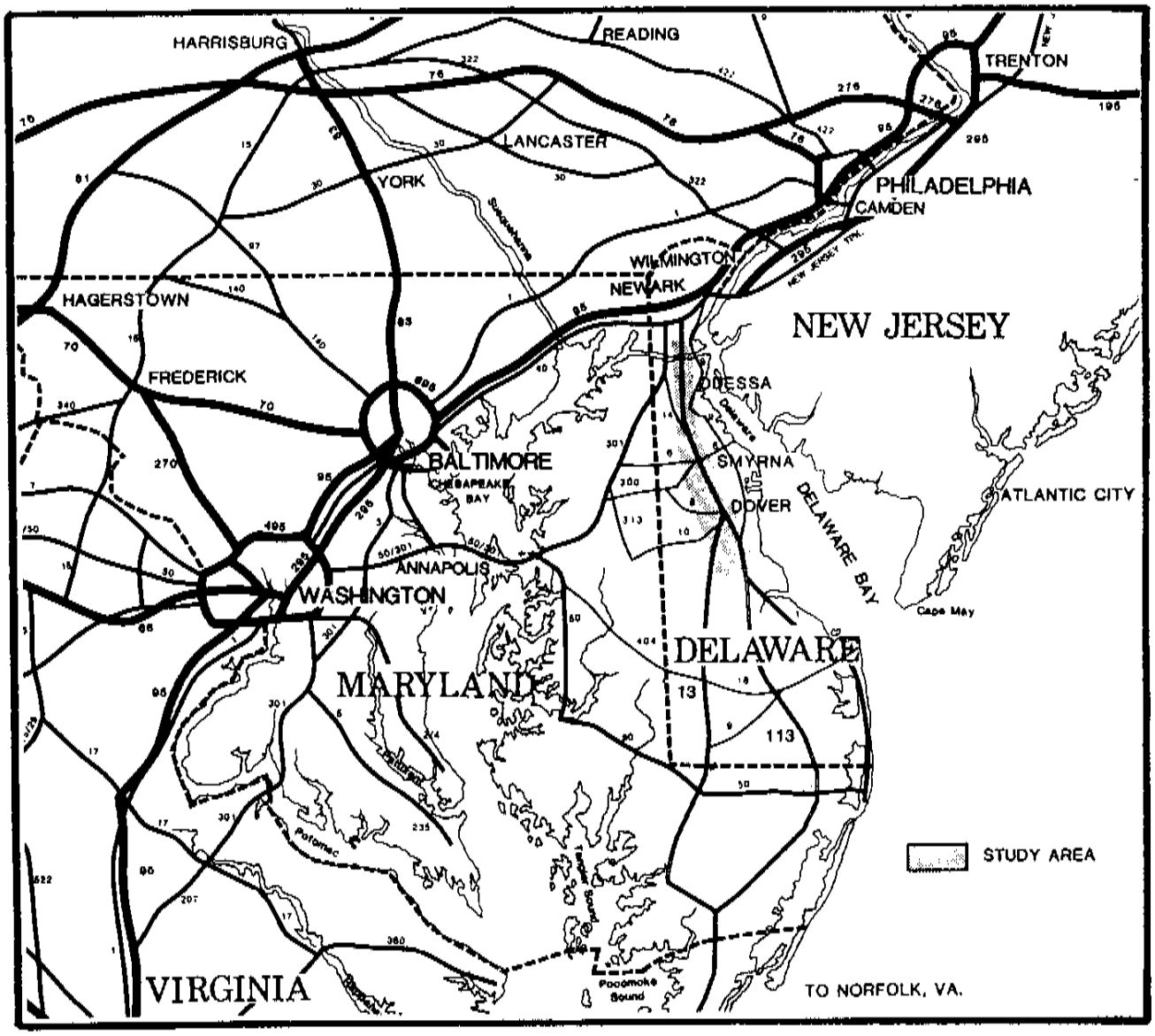
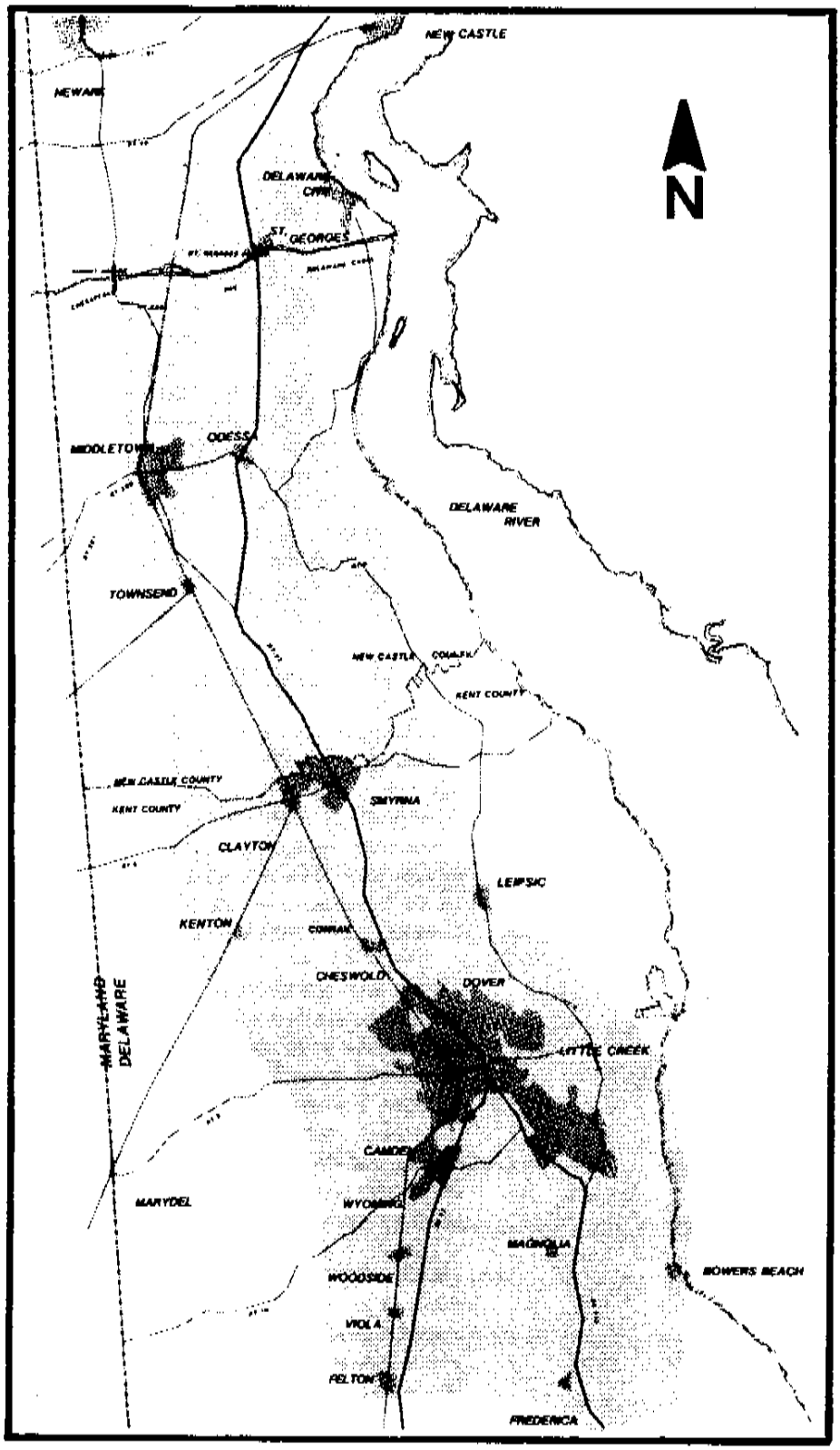


FIGURE 2
U. S. Route 13 Study Area



Smyrna/Clayton, Middletown and Odessa are the other major communites in the study area. Smyrna/Clayton is a residential and agricultural community with a population of over 12,000 people while Middletown has around 9,000 people. Odessa while smaller, is an important enclave of historic homes dating from the colonial period. Significant commercial activity in Smyrna is located on Route 13. The areas around Dover have been growing rapidly in the past 15 to 20 years, with single-family home subdivisions being the largest land use. Continued growth is expected in these areas, along with commercial activities to serve the residential population. Areas west of Route 13 within the study area, away from the built-up municipalities, tend to be devoted to farming activities; areas on the eastern side of the study area are generally devoted to farming and wetland areas.

This volume presents overviews of the three main classes of resources encountered in the proposed U.S. Route 13 corridor: prehistoric archaeological sites, historic archaeological sites, and standing structures. The essays are summaries of data gathered in more intensive planning studies of the corridor's resources (Custer, Jehle, Klatka, and Eveleigh 1984; Custer and Bachman 1985; Custer, Bachman, and Grettler 1986). For the purposes of project planning all site data were organized by standardized project segments called data links (Figures 3-5). The archaeological data were gathered and analyzed by staff of the University of Delaware Center for Archaeological Research. The inventories of standing structures were compiled from existing inventories maintained by the Delaware Bureau of Archaeology and Historic Preservation. Analysis and assessment

FIGURE 3

Data Links – Odessa Segment

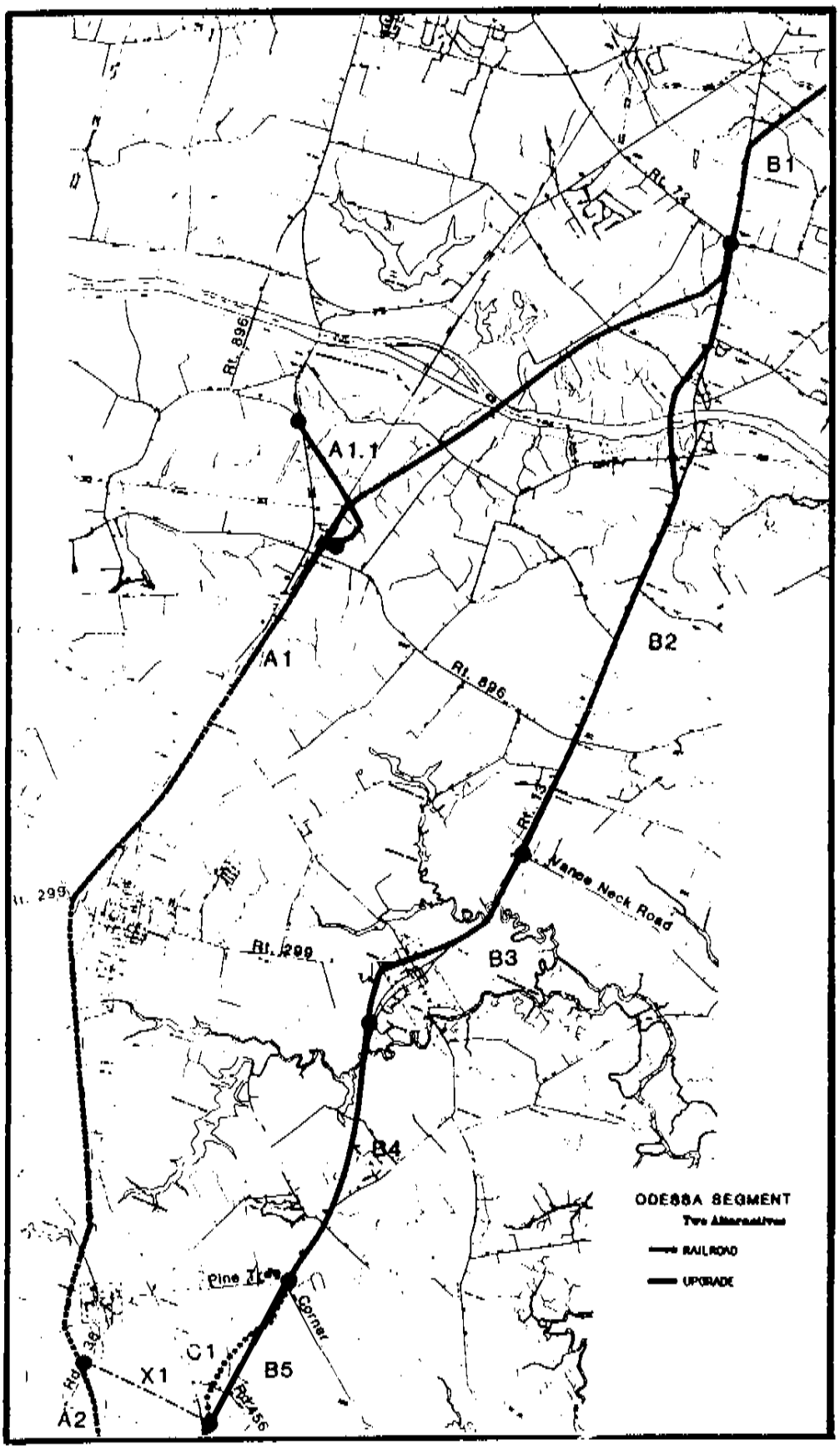


FIGURE 4

Data Links – Smyrna Segment

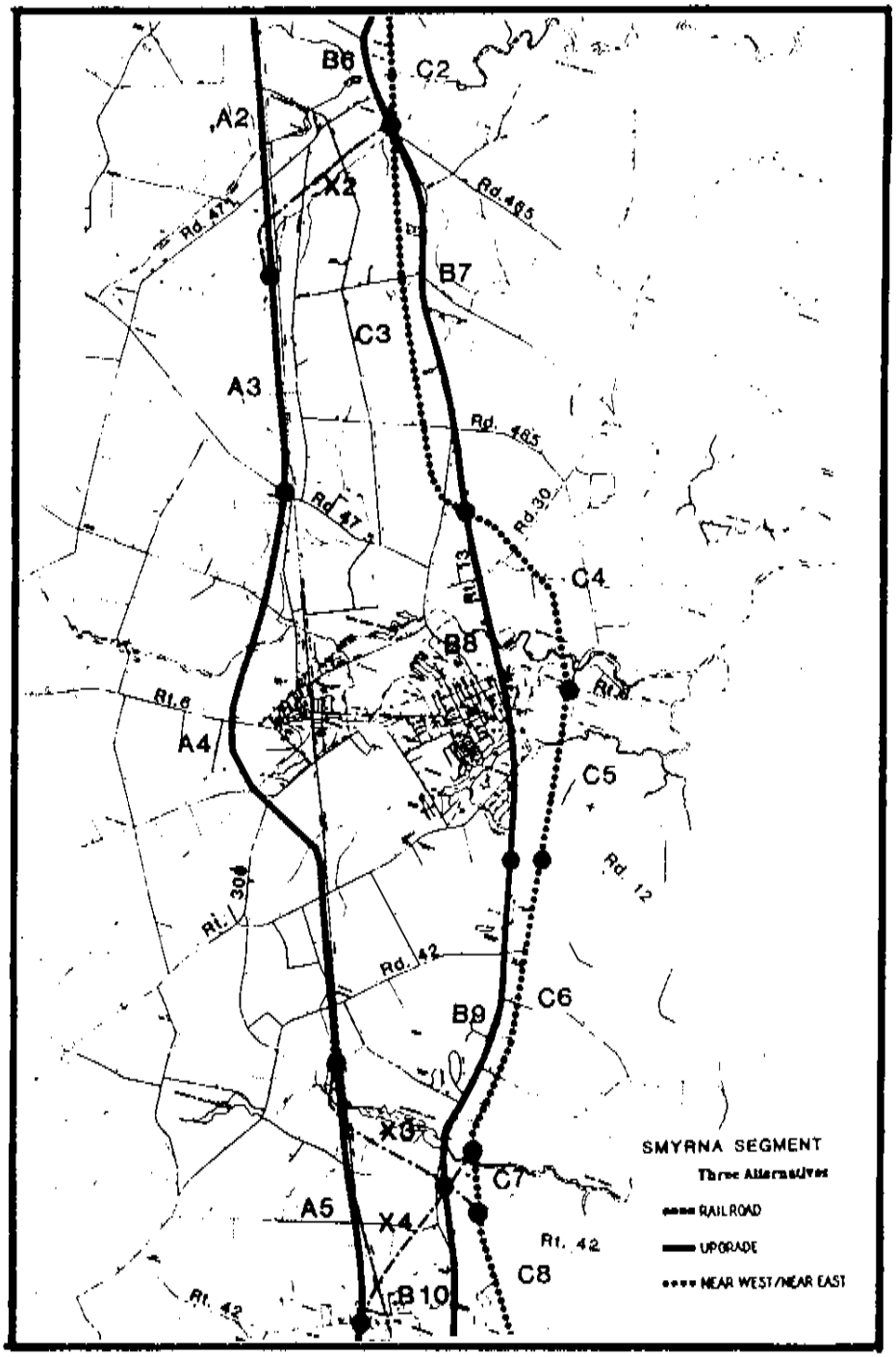
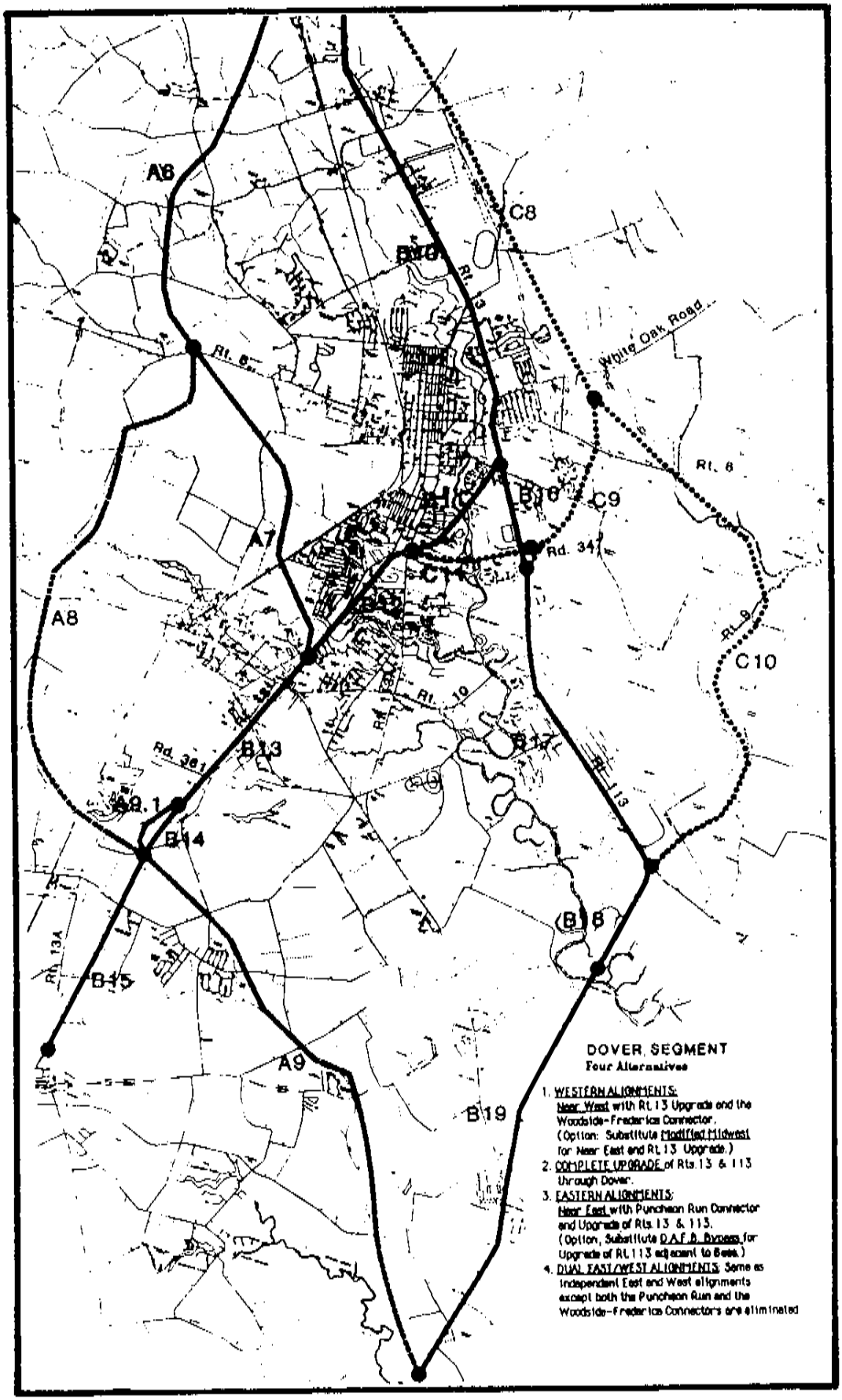


FIGURE 5

Data Links – Dover Segment



of standing structures were undertaken by Wade Catts as a private consultant to Killinger, Kise, Franks, and Straw, Inc. A summary of the cultural resource management considerations is also provided along with the final draft memorandum of agreement for the project.

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PREHISTORIC ARCHAEOLOGICAL RESOURCES OF THE PROPOSED ROUTE 13 CORRIDOR: AN OVERVIEW

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The purpose of this overview is to briefly describe the types of prehistoric archaeological resources which have been identified within, and which are expected to be within, the two proposed Route 13 corridor alignments. Expected site locations are based on probability distributions which were developed during the initial planning study (Custer, Jehle, Klatka, and Eveleigh 1984) and tested in later studies (Custer and Bachman 1985; Custer, Bachman, and Grettler 1986). All known sites and projected probability zones are noted on the attached maps and listed in the Appendix to this report.

In general, this overview will first describe the environmental setting of the study area as it relates to the regional prehistoric archaeology. Then, each of the major archaeological time periods will be reviewed and relevant sites within the project area will be discussed. Finally, potentially significant sites, and classes of sites, which are likely to be eligible for listing on the National Register of Historic Places will be noted.

ENVIRONMENTAL SETTING

In order to understand the regional prehistory of the study area, it is first necessary to consider the local environmental settings. The proposed alignments are located in Delaware's Coastal Plain and for the study of the prehistoric resources of the region, a number of varied environmental zones are recognized in the Coastal Plain. Each of these zones is described below and the descriptions are derived from the work of Custer(1984a).

High Coastal Plain - Located between the Fall Line and the Smyrna River (Data Links A1 - A4, B1 - B8, C1 - C5, X1, and X2), the High Coastal Plain is characterized by a rolling topography and elevation differences which can range up to 16 meters (50 feet) from the headlands bordering high order streams and adjacent floodplain marshes. These differences are sufficient to cause varied distributions of plant and animal species (Braun 1967:246-247). Watercourses are deeply incised. Most streams are not completely tidal and the freshwater/saltwater mix allows for a wide range of resources. Soils include a variety of well-drained and poorly drained settings that are distributed in a mosaic pattern across the region.

Low Coastal Plain - The Low Coastal Plain includes most of Kent County (Data Links A5 - A9.1, B9 - B19, C6 - C11, X3, and X4) and is underlain by the sands of the Columbia formation which have been extensively reworked to a flat and relatively featureless landscape. Elevation differences range up to 13 meters (30 feet) and these small differences are moderated by long and gradual

slopes. River systems are tidal through most of their middle and lower reaches with extensive marshes found along the Delaware Bay. These riverine systems would combine a wide variety of environmental settings and resources and are especially attractive human habitation areas. Much of the area is well-drained; however, there are some extensive areas of poor drainage.

Within the High and Low Coastal Plain there are a number of smaller environmental zones. These additional sources of environmental variability are generally distributed in broad belts parallel to the Delaware River and Bay shore. Each is described below.

Mid-Peninsular Drainage Divide - Representing the "spine" of the Delmarva Peninsula, this area is defined by the stretch of low, rolling topography that separates the headwaters of streams that drain into the Delaware Bay from streams that drain into the Chesapeake Bay. Elevation differences are slight and flowing surface water is restricted to the low order headwaters of the larger streams and rivers. Additional water sources of this zone include a number of swamps that have formed in areas of poorly drained soils surrounded by sand ridges. Bay/basin features, known locally as "whale-wallows", represent another water source in this area. Geomorphological evidence indicates that they were formed during the Pleistocene and many seem to have held water, at least seasonally, ever since (Rasmussen 1958:82). The combination of headwater drainages, swampy areas, and bay/basin features with interspersed well-drained areas creates a mosaic of

edaphic settings and this mosaic provides a wide range of resources which could be used by hunters and gatherers.

Mid-Drainage - The Mid-Drainage zone is located to the east of the Mid-Peninsular Drainage Divide zones. The modern tidal limit along the drainages marks the center of this zone, and the major drainages and their tributaries are fresh throughout the inland portion of the zone. Some tidal marshes and poorly drained floodplains are found along the major drainages. Well-drained soils are found on upper terraces of the drainages and on isolated headlands between the major drainages and their tributaries. The extensive combination of brackish and freshwater resources makes this area one of the richest in Delaware for prehistoric hunters and gatherers.

It should be noted that the locations of these environmental zones have not remained constant since the end of the Pleistocene because some areas have been subjected to extensive landscape modification. The most important factor in this landscape modification is post-Pleistocene sea level rise. Kraft et al. (1976) note that sea level has been rising along the Atlantic Coast for the past 12,000 years and this sea level rise has transformed the Delaware River of 10,000 B.C. into the current drowned estuary. Many old land surfaces have become submerged and the configuration of the Delaware River and Delaware Bay have changed dramatically. In terms of the study area, these effects would be most prevalent in the eastern half of the Mid-Drainage zone.

REGIONAL PREHISTORY AND ARCHAEOLOGICAL SITES

This summary of the regional prehistory is abstracted from Custer (1984a). The prehistoric archaeological record of the Delaware Coastal Plain can be divided into four large blocks of time: The Paleo-Indian Period (ca 12,000 B.C, - 6500 B.C.), the Archaic Period (6500 B.C. - 3000 B.C.), the Woodland I Period (3000 B.C. - A.D. 1000), and the Woodland II Period (A.D. 1000 - A. D. 1650). A fifth time period, the Contact Period may also be considered and spans from A.D. 1600 to A.D. 1750, the approximate date of the final Indian habitation of Delaware in anything resembling their pre-European Contact form. Each of these periods is described below.

Paleo-Indian Period (12,000 B.C. - 6500 B.C.) - The Paleo-Indian Period encompasses the time period of the final retreat of Pleistocene glacial conditions from Eastern North America and establishment of more modern Holocene environments. The distinctive feature of the Paleo-Indian Period is an adaptation to the cold, and alternately wet and dry, conditions at the end of the Pleistocene and the beginning of the Holocene. This adaptation was primarily based on hunting and gathering with hunting providing a large portion of the diet. Hunted animals may have included now-extinct megafauna and moose. A mosaic of deciduous, boreal, and grassland environments would have provided a large number of productive habitats for these game animals in central Delaware and watering areas would have been particularly good hunting settings.

Tool kits of the people who lived at this time were oriented

toward the procurement and processing of hunted animal resources. A preference for high quality lithic materials is noted in the stone tool kits and careful resharpening and maintenance of tools is common. A mobile lifestyle moving among the game attractive environments is hypothesized with the social organizations being based upon single and multiple family bands. Throughout the 5500 year time span of the period, the basic adaptation remains relatively constant with some modifications being seen as Holocene environments appear at the end of the Paleo-Indian Period.

Numerous Paleo-Indian sites are noted for the Delaware Coastal Plain. Most of the sites are associated with poorly drained swampy areas and include the Hughes Paleo-Indian complex near Felton (Custer 1984a:58-59). No Paleo-Indian sites have been discovered in the proposed alignments; however, several late Paleo-Indian (notched point) sites were discovered during the planning survey of the Kent County portions of the study area (Custer, Bachman, and Grettler 1986). These sites are located in the Mid-Peninsular Drainage Divide zone and appear to be similar to the Hughes Early Man Complex. For the most part, these sites are thought to represent intensively utilized procurement camps and small base camps. Additional similar sites will probably be encountered within the Railroad Alternative Alignments (specifically in Data Links A5 - A9 and B15) where it traverses the Mid-Peninsular Drainage Divide, and all would be eligible for listing on the National Register of Historic Places (Custer 1983:38-47). It is also highly likely that these sites will be associated with buried Pleistocene/early Holocene river

edge swamp deposits similar to the Dill Farm site (Custer and Griffith 1984). These kinds of sites provide valuable paleoenvironmental data and would probably also need to be investigated in future data recovery projects.

Earlier studies (Custer et al. 1984:26-31) suggested that the bay/basin features of southern New Castle County may have also been locations of Paleo-Indian sites based on studies of similar features in New Jersey (Bonfiglio and Cresson 1981). However, intensive survey of 148 bay/basin features in the Townsend/Blackbird area (Custer and Bachman 1985) revealed no Paleo-Indian sites. The absence of Paleo-Indian period sites at bay/basin locales may be due to the absence of flowing surface water associated with bay/basin features, or may be due to the absence of an association of high quality lithic sources and bay/basin features.

Archaic Period (6500 B.C. - 3000 B.C.) - The Archaic Period is characterized by a series of adaptations to the newly emerged full Holocene environments. These environments differed from earlier ones and were dominated by mesic forests of oak and hemlock. A reduction in open grasslands in the face of warm and wet conditions caused the extinction of many of the grazing animals hunted during Paleo-Indian times; however, browsing species such as deer flourished. Sea level rise is also associated with the beginning of the Holocene in Delaware. The major effect of the sea level rise would have been to raise the local water table, which helped to create a number of large interior swamps. Adapations changed from the hunting focus of

the Paleo-Indian to a more generalized foraging pattern in which plant food resources played a more important role. Large swamp settings apparently supported large base camps, but none are known from the study area. A small number of small procurement sites in favorable hunting and gathering locals such as bay/basin features are known from Delaware's Coastal Plain.

Tool kits were more generalized than earlier Paleo-Indian tool kits and showed a wider array of plant processing tools such as grinding stones, mortars, and pestles. A mobile lifestyle was probably common with a wide range of resources and settings utilized on a seasonal basis. A shifting band level organization which saw the waxing and waning of group size in relation to resource availability is evident. Known sites include large base camps such as the Clyde Farm Site in northern Delaware and smaller processing sites located at a variety of locations and environmental settings.

Intensive planning surveys carried out to date have located five Archaic sites associated with bay/basin features (Custer and Bachman 1985). One site (7NC-J-99) is located within the alignment in Data Link B7. For the most part, these sites are small, ephemerally-used procurement/processing sites. However, intensive testing at one of these sites (7NC-H-20) seems to indicate that some small base camps, or staging sites, may also be associated with bay/basin features as evidenced by the presence of relatively dense tool manufacturing debris at 7NC-H-20. It should be noted that 3 Archaic sites associated with stream floodplain sites were also discovered in the northern

study area.

Only 9 Archaic sites were previously recorded for the Delmarva High Coastal Plain; therefore, the 8 Archaic sites discovered in the intensive surveys to date almost double the number of known Archaic sites in the High Coastal Plain. In all of Delaware there are only 40 Archaic sites recorded. Therefore, any Archaic sites discovered within the alignments would be eligible for listing on the National Register of Historic Places as long as they had contextual integrity. Also, preliminary analysis of the bay/basin sediments has shown that they contain abundant pollen (Custer and Bachman 1985) and they would have to be investigated as part of future data recovery projects in order to reconstruct the environmental settings of these sites.

The distribution of Archaic sites in the study area indicates that the beginning of bay/basin utilization seems to occur at the same time as a series of rather dramatic environmental changes. During the period from 8500-6000 BC there is evidence from numerous sites indicating dry climatic conditions (Custer 1984a:47-48; Custer and Griffith 1984). Environments seemed to have changed from a mosiac of grasslands, swamps, boreal forests, and deciduous forests to a closed boreal forest with fewer poorly drained settings. The presence of wind-blown sediments (Foss et al. 1978) and evidence of pronounced changes in stream channel morphology (Custer and Griffith 1984: Fig. 5) also indicate potential dramatic changes in the patterns of surface water availability. The beginnings of bay/basin utilization may be related to these environmental changes. It is possible that changes in stream channel morphology altered the

distribution of swampy settings in the mid-peninsular drainage divide, as evidenced at the Dill Farm site (Custer and Griffith 1984), and caused late Paleo-Indian and Archaic groups to seek out new swampy hunting stations, such as the bay/basin features. Another factor which may have been contributed to a shift to new procurement sites locations, including bay/basins, during the Archaic period is the fact that during late Paleo-Indian and Archaic times the emphasis on high grade cryptocrystalline lithic materials seems to have disappeared (Custer 1984a:59-60). If association of bay/basins and lithic sources was no longer a critical factor in site selection, then the bay/basin sites of the study area may have become a more attractive settlement option. Once these bay/basin procurement sites became part of the settlement pattern in interior areas, their utilization continued into warm-wet climatic conditions of the post-6000 B.C. time period (Custer 1984a:62-64).

The Archaic sites associated with stream settings seem to be similar in size and artifact composition to others described for the Delmarva Coastal Plain (Wise 1983; Kavanagh 1979; Custer and Galasso 1983; Galasso 1983) and are primarily small procurement sites. These sites probably represent hunting and procurement sites which support other base camp sites. Some of the larger basecamp sites have been tentatively identified elsewhere in Delaware (Custer 1984a:69-72); however, none were identified in the study area. It may be possible that there are no large Archaic base camps in the Coastal Plain areas away from the large interior swamps. Some of the Archaic sites found in intensive

surveys may be small base camps rather than procurement sites and the present survey methods were unable to distinguish the differences between the two site types. Both Wise (1983) and Galasso (1983) have suggested that the Delaware Coastal Plain Archaic settlement pattern is characterized by small habitation and procurement sites and Kraft and Mounier (1982) note similar patterns in the New Jersey Coastal Plain. The data on Archaic sites from the Route 13 project areas seem to support this model.

Woodland I Period (3000 B.C. - A.D. 1000) - The Woodland I Period can be correlated with a dramatic change in local climates and environments that seems to be part of events occurring throughout the Middle Atlantic region. A period of pronounced warm and dry conditions sets in and lasts from ca. 3000 B.C. to 1000 B.C. (Custer 1984b). Mesic forests were replaced by xeric forests of oak and hickory and grasslands again became common. Some interior streams dried up; however, the overall effect of the environmental change is an alteration of the environment, not a degradation. Continued sea level rise and a reduction in its rate also made many areas of the Delaware River and Bay shore the sites of large brackish water marshes which are especially high in productivity. The major changes in environment and resource distributions caused a radical shift in adaptations for prehistoric groups. Important areas for settlements included the major river floodplains and estuarine swamp areas. Large base camps with fairly large numbers of people are evident in many settings in the Delaware Coastal Plain, such as the Barker's Landing, Coverdale, Hell Island, and Robbins Farm sites. These

sites seem to have supported many more people than earlier base camp sites and may have been occupied for several seasons of the year. The overall tendency is toward a relatively more sedentary lifestyle.

The tool kits of the Woodland I Period show some minor variations as well as some major additions from previous Archaic tool kits. Plant processing tools become increasingly common and seem to indicate an intensive harvesting of wild plant foods that may have approached the efficiency of agriculture by the end of the Woodland I Period. Chipped stone tools changed little from the preceding Archaic Period; however, broad-blade, knife-like processing tools became more prevalent. The addition of stone, and then ceramic, containers is also seen. These items allowed the more efficient cooking of certain types of food and may also have functioned for storage of certain surplus plant foods. Storage pits and semi-subterranean houses are also known for the Delaware Coastal Plain during this period from the numerous sites.

Social organizations also seem to have undergone radical changes during this period. With the onset of relatively sedentary lifestyles and intensified food production, which might have produced occasional surpluses, incipient ranked societies began to develop as indicated by the presence of extensive trade and exchange in lithic materials for tools, as well as for non-utilitarian artifacts, and caching of special artifact forms. The data from cemeteries of the Delmarva Adena Complex (ca. 500 B.C. to A.D. 0), such as the Frederica Site and the St. Jones Site (Thomas 1976), indicate that certain individuals had special

status in these societies and the existence of a ranked social organization is hypothesized. Similar data from the Island Field Site show that these organizations lasted up until A.D. 1000, although they may not have always been present throughout all of the Woodland I Period. By the end of the Woodland I Period a relatively sedentary lifestyle is evident in Delaware's Coastal Plain. It should also be noted that the greatest number of archaeological sites in the project areas date to the Woodland I Period and the Mid-Drainage zone is the focus of most of the important sites of this period.

The Woodland I period sites of the study are the largest and most numerous of all time periods. The analysis of site size for the northern portions of the alignments (Custer and Bachman 1985) showed that not only are most of the Woodland I sites larger than sites from other time periods, but several very large Woodland I sites were present. These very large sites are identified here as macroband base camps and are located primarily along the Appoquinimink River, the highest order stream in the northern study area. Similar large sites are noted on the Smyrna, Leipsic, St. Jones, and Murderkill drainages in the southern portion of the study area (Custer and Bachman 1985b). Current models of Woodland I settlement patterns and adaptations (Custer 1982; 1984a:94-98; 1984b; Catlin et al. 1982) all note a shift of large base camp sites to major drainage floodplain and headland settings and a general increase in local population densities in these areas during Woodland I times. The Route 13 survey data support this model. Major use of bay/basin sites during Woodland

I times (Custer and Bachman 1985) support the site models noted above which also describe a widespread, but ephemeral, use of interior areas. Interior Woodland I sites other than those associated with bay/basin features from the Route 13 data also support this model and the distribution of sites in the interior areas is quite similar to that noted for the Upper Chester drainage in Kent and Queen Annes counties, Maryland (Kavanagh 1979).

Non-local lithic materials, such as rhyolite, argillite, steatite, and ironstone, are present at many of the sites recorded in the earlier Route 13 surveys. These non-local materials tend to be found at the larger Woodland I base camp sites. The presence of these "exotic" materials in the study area indicates that local Woodland I groups were participating in trade and exchange networks as noted in several studies (Ward and Doms 1984; Custer 1984c). Participation in trade and exchange networks at the larger Woodland I sites indicates increasing social complexity at these sites.

It would be useful to discuss the site locations and assemblage characteristics at a time level smaller than the period, such as the archaeological complexes which are used to divide the Woodland I period in terms of time and space (Custer 1984a:28-30,78,89). However, there are insufficient data on diagnostic artifacts from the Route 13 survey to develop any counts of sites at the level of the archaeological complex (see Appendix).

Not all classes of Woodland I sites are eligible for the National Register. The larger base camp sites would all be

eligible regardless of whether or not they were plowed. Their large size and high potential for preserved complicated features makes data recovery at these sites an expensive proposition. These sites would be primarily found within the high probability zones of the major drainages. Many of these sites were found in the initial surveys (Custer et al. 1984; Custer and Bachman 1985; Custer, Bachman, and Grettler 1986) and a series of these sites are located within the alignment in Data Link A9 (Griffith and Artusy 1976). Smaller Woodland I procurement sites, if unplowed, are eligible for the National Register and are also numerous in all probability zones.

Woodland II Period (A.D. 1000 - A.D. 1650) - In many areas of the Middle Atlantic, the Woodland II Period is marked by the appearance of agriculture food production systems; however, in the Delaware Coastal Plain there are no clear indications of such a shift. Some of the settlements of the Woodland I Period, especially the large base camps, were also occupied during the Woodland II Period and very few changes in basic lifestyles and overall artifact assemblages are evident. Intensive plant utilization and hunting remained the major subsistence activities up to European Contact. There is some evidence, nonetheless, of an increasing reliance on plant foods and coastal resources throughout the Woodland II Period in the study area, especially in the more southern areas. Social organization changes are evidenced by a collapse of the trade and exchange networks and the absence of elaborate cemeteries.

Woodland II settlement patterns in central Delaware are a topic of some controversy. For many years, numerous authors have suggested that there is a relative absence of Woodland II sites in southern New Castle County and northern Kent County. By the same token, up until 1980 the nature of the northern New Castle Woodland II occupations were also very poorly refined. Nonetheless, the southern New Castle County and northern Kent County area was viewed as a "buffer zone" or "fever belt" (Withoft 1984) separating two distinctive ethnic groups. The original Route 13 planning study analyzed extant artifact collections and noted numerous Woodland II sites in the supposed "buffer zone" making the whole concept somewhat invalid (Custer et al. 1984:220-221). The "discovery" of these sites was due to the fact that previous analyses had not recognized the Woodland II Minguannan ceramics in the collections because the type was not defined in the literature prior to 1981 (Custer 1981).

The discovery of Woodland II sites in later surveys (Custer and Bachman 1985; Custer, Bachman, and Grettler 1986) reveals a similar bias in previous studies which caused Woodland II sites to be under-represented in the data base. Most of the Woodland II sites, and all of the sites with Minguannan pottery, were discovered during sub-surface testing of wooded areas dividing plowed fields from bluffs along the major drainages. The sites are small and appear along most of the major stream headlands studied. Furthermore, they are almost all unplowed and would have been, and were, missed in previous studies which focused primarily on surface survey of cultivated fields. Thus, there really is no absence of Woodland II sites in the study area and

there is no need to invent a "buffer zone".

It can be noted that Woodland II sites in the northern portions of the study area are generally smaller than the Woodland II sites found farther south on the Delmarva Peninsula (Custer 1984a:157-171; Custer and Griffith n.d.). However, the Woodland II sites of the study area fall well within the range of site sizes seen among Woodland II sites of the Minguannan and Slaughter Creek Complexes (Custer 1984a:155-157; Stewart et al. n.d.).

The range of Woodland II sites eligible for listing on the National Register would be similar to those of the Woodland I period. The small Minguannan base camp sites would be of special interest and significance and are located in Data Links B3, B8, C4, and C5.

Contact Period (A.D. 1650 - A.D. 1750) - The Contact Period is an enigmatic period of the archaeological record of Delaware which begins with the arrival of the first substantial numbers of Europeans in Delaware. The time period is enigmatic because no Native American archaeological sites that clearly date to this period have yet been discovered in Delaware. A number of sites from the Contact Period are known in surrounding areas, such as southeastern Pennsylvania, nonetheless. It seems clear that Native American groups of Delaware did not participate in much interaction with Europeans and were under the virtual domination of the Susquehannock Indians of southern Lancaster County, Pennsylvania. The Contact Period ends with the virtual extinction of Native American lifeways in the Middle Atlantic

area except for a few remnant groups.

Contact Period sites are not expected for the study area, but if any were found to be present, they would clearly be eligible for listing on the National Register of Historic Places.

MANAGEMENT CONSIDERATIONS

Detailed statements of cultural resource management considerations are provided in a separate overview, but a few comments can be made here. The listing of known sites provided in the Appendix and the other planning studies is not a comprehensive statement of all of the prehistoric sites in the project area alignments and should be viewed as a sample of the sites. For management purposes, it is more useful to use the projected probability zones which are marked on the enclosed maps. The marked probability zones are based on the initial models reported by Custer et al. (1984: Attachment V) and have been adjusted based on field testing (Custer and Bachman 1985; Custer, Bachman, and Grettler 1986), It should be noted that the unadjusted models operated at an accuracy level greater than 90% and with the adjustments they are probably even more accurate.

Table 1 provides an estimate of the percentage of the area of the alignment within each data link that falls within each probability zone. These percentages can be used to estimate the relative amount of data recovery that might be required within any given data link. The high probability zones will not only have more sites, but they are also more likely to have more large sites eligible for listing on the National Register of Historic

TABLE 1: Prehistoric Site Probability Zones and Data Links

Data Link	Probability Zones		
	High	Medium	Low
A1.1	0	0	100
A1	0	8	92
A2	18	69	13
A3	0	14	86
A4	13	39	48
A5	0	0	100
A6	8	25	67
A7	25	13	62
A8	15	47	38
A9	51	21	28
A9.1	100	0	0
B1	0	0	100
B2	0	13	87
B3	0	38	62
B4	31	25	44
B5	17	33	50
B6	0	0	100
B7	0	6	94
B8	6	17	77
B9	14	27	59
B10	35	18	47
B11	100	0	0
B12	100	0	0
B13	18	82	0
B14	100	0	0
B15	0	50	50
B16	100	0	0
B17	83	17	0
B18	83	0	17
B19	7	44	49
C1	0	100	0
C2	0	0	100
C3	7	14	79
C4	0	14	86
C5	0	17	83
C6	10	19	71
C7	25	50	25
C8	0	69	31
C9	18	41	41
C10	27	63	10
C11	100	0	0
X1	6	58	38
X2	13	47	40
X3	13	87	0
X4	25	75	0

Places. Therefore, the high probability zones are the most sensitive areas for significant prehistoric cultural resources.

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APPENDIX: KNOWN SITES
SITES, DATA LINKS, TIME PERIODS

SITE NUMBER	DATA LINK	PALEO INDIAN	ARCHAIC	WOODLAND I	WOODLAND II
7NC-H-48	A2				
3-4-M	A5				
3-4-L	A5			Y	
3-4-K	A5				
3-4-J	A5				
7K-C-160	A8				
7K-C-71	A8				
7K-E-5	A8				
7K-C-57	A8				
7K-C-83	A8				
7K-F-61	A9				
7K-F-58	A9			Y	
7K-F-57	A9			Y	
7K-F-54	A9			Y	
7K-F-44	A9			Y	Y
7K-F-12	A9			Y	
7K-F-46	A9			Y	
7K-F-47	A9			Y	Y
7K-F-55	A9			Y	
7K-E-108	A9			Y	
7K-E-110	A9				
7K-F-48	A9			Y	Y
7K-F-2	A9				
7K-F-50	A9				
7NC-G-97	B2				
7NC-G-13	B3				
7NC-G-21	B4				
7NC-J-49	B6				
7NC-J-50	B6				
7NC-J-97	B7				
7NC-J-93	B7				
7NC-J-96	B7				
7NC-J-94	B7				
7NC-J-95	B7			Y	
7NC-J-92	B7				
7NC-J-110	B7			Y	
7NC-J-101	B7				
7NC-J-100	B7				
7NC-J-99	B7		Y		
3-9-E	B10				
7K-C-6	B10			Y	
7K-D-12	B19				
12-1-T	C4				
12-1-P	C4				
12-1-S	C4				
12-1-U	C4				
12-1-X	C4				
12-1-W	C4				

APPENDIX: KNOWN SITES (CTD)
SITES, DATA LINKS, TIME PERIODS

SITE NUMBER	DATA LINK	PALEO INDIAN	ARCHAIC	WOODLAND I	WOODLAND II
3-8-D	C7				Y
3-7-A	C7				
3-9-D	C8				
3-9-B	C8				
3-9-C	C8				
7K-D-8	C10		Y	Y	Y
7K-D-33	C10				
7K-D-69	C10		Y	Y	Y
3-6-B	X3				
7K-C-54	X3			Y	

SITES,DATALINKS, COMPLEXES

SITE NUMBER	DATA LINK	COMPONENTS
7K-F-58	A9	BARKERS LANDING DELMARVA ADENA
7K-F-54	A9	BARKERS LANDING DELMARVA ADENA CAREY WEBB
7K-F-44	A9	BARKERS LANDING DELMARVA ADENA CAREY
7K-F-12	A9	BARKERS LANDING SLAUGHTER CREEK
7K-F-46	A9	BARKERS LANDING CAREY WEBB
7K-F-47	A9	BARKERS LANDING DELMARVA ADENA WEBB SLAUGHTER CREEK
7K-F-55	A9	BARKERS LANDING DELMARVA ADENA CAREY WEBB
7K-E-108	A9	BARKERS LANDING
7K-F-48	A9	BARKERS LANDING WEBB
7K-C-6	B10	BARKERS LANDING WOLFE NECK WEBB
7K-D-12	B19	BARKERS LANDING
3-8-D	C7	SLAUGHTER CREEK
7K-D-69	C10	BARKERS LANDING SLAUGHTER CREEK
7K-C-54	X3	WEBB

HISTORIC ARCHAEOLOGICAL RESOURCES OF THE PROPOSED ROUTE 13 CORRIDOR: AN OVERVIEW

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The purpose of this overview is to briefly describe the types of historic archaeological resources which have been identified within, and which are expected to be within, the proposed Route 13 corridor alignments. Expected site locations are based on probability distributions which were developed during the initial planning study (Custer, Jehle, Klatka, and Eveleigh 1984) and refined in later studies (Custer and Bachman 1985; Custer, Bachman, and Grettler 1986). All known sites and projected probability zones are noted on the attached maps and listed in the Appendix to this report.

In general, this overview will review the regional historical setting of the project area and will discuss relevant sites within the project area. Potentially significant sites, and classes of sites, which are likely to be eligible for listing on the National Register of Historic Places will be noted.

REGIONAL HISTORY AND ARCHAEOLOGICAL SITES

This overview is abstracted from Munroe (1978), Hoffecker (1973, 1977), Weslager (1961, 1967), Lemon (1972), and Hancock (1932). The earliest colonial settlement in Delaware was the Dutch settlement of Zwaanendael which was established as a

whaling colony near present-day Lewes in 1629. The settlement was short-lived as the early colonists were massacred by local Indians in 1632. Further north, the Swedes and Finns established Fort Christina in 1638 at the confluence of the Brandywine and Christina Rivers in what is now Wilmington. The small colony grew and within a few years a fort, church and small farming community had appeared and formed the nucleus for the first permanent European settlement in Delaware. This community contested the Dutch settlements further north in the Delaware Valley.

Dutch colonial interests continued and in 1651 Fort Casimir was established near modern New Castle. Conflicts between the Dutch and the Swedes escalated to military conflict, as both groups infringed on the rights of the other. The Dutch were ascendent and they appropriated the Swedish colonies. Fort Casimir was renamed Fort Trinity, and New Amstel, a farming and trading settlement, arose nearby. The Dutch claims included all land from the Christina River to Bombay Hook by the early 1660's, including a portion of the project area.

British hegemony of the region began in 1664 when Sir Robert Carr seized the Dutch colonies and assumed possession for James, Duke of York and Albany. Anglicizing the new colony was a slow and gradual process; however, the transfer of authority from Dutch to British hands was peaceful with existing land ownership, trading privileges and political structure maintained by the new leadership. The Swedish, Finnish, and Dutch colonists remained in Delaware and new immigrants of those nationalities, as well as English and Scotch-Irish, supplemented the growing population to

form a multi-ethnic community.

In 1682, William Penn was granted proprietary rights over Pennsylvania and the Lower Three Counties which included the city of New Castle, the land within a 12-mile radius of the New Castle courthouse, and the land on the west bank of the Delaware Bay (including all of modern Delaware). Conflicts soon developed between the Quakers of Pennsylvania and the colonists of the Three Lower Counties, and these led to the establishment of separate governmental bodies and relative autonomy for the southern colonists. However, economic ties continued to link Penn's factionalized colony. The Penn family's claims to interest in the colony were finally relinquished just prior to the American Revolution.

Settlement patterns in the project area from the Colonial Settlement Period (1638-1681) are extremely difficult to define because both archaeological investigation and documentary research for the period are in developmental stages. Wise (1978, 1979) has presented a preliminary model for settlement patterning in the early colonial period applicable to Dutch settlements in the vicinity of New Castle, Appoquinimink, St. Jones Neck, and Lewes. Research on the Chesapeake tidewater of Maryland and Virginia provides the most detailed data on early colonial settlement patterning in an area which shares environmental and economic similarities with Delaware (see Earle 1975; Kelly 1979; Custer 1983; Wesler et al. 1981; Wesler 1982). The three sites in the Saint Georges Hundred identified in this report, and the studies noted above provide a limited basis for defining early

colonial settlement patterning and plotting potential site locations.

Dispersed plantations and farmsteads close to the tidewater shoreline and water transport facilities were the predominant settlement types (Wise 1979; Earle 1975; Kelly 1979; Middleton 1953). The study area sites are located at the first extensive area of well-drained land along the major drainage systems. The pattern of locating houses on well-drained soils within 300 feet of a drainage bank has also been identified by Wise (1978,1979) in the St. Jones Neck area. The long-lot system of settlement, or variations on it, is seen on these early historic sites, in tidewater Delaware, Maryland, and Virginia (Wise 1978, 1979; Earle 1975; Kelly 1979; Delaware Division of Historic and Cultural Affairs 1976:15), and would apply to sites in the project area. The long-lot system established linear land units extending from a shoreline or stream bank toward the drainage divide. Dwellings were constructed near the shore with agricultural lands behind. Distances ranging from one-quarter to one and one-half miles separated dwellings and resulted in a dispersed settlement pattern (Earle 1975). This system provided accessibility to the major water transportation routes for all landowners, demonstrating the strong water-orientation in communities where overland transportation networks were in initial stages of development (Middleton 1953). Nevertheless, where road networks were present, particularly trans-peninsular roads, there were also clusters of settlements.

Structures present at early colonial agricultural complexes would have included small, wood frame dwellings and a wide

variety of outbuildings: kitchens, meat houses, hen houses, milk houses, stables, bake houses, and grain and tobacco sheds (Earle 1975). Occupational specialists were limited in number and variety (Earle 1975), most likely because the early agricultural complexes maintained self-sufficiency by retaining part-time specialists, thereby creating a limited demand for services. Docks and warehouses, and perhaps merchant offices and dwellings, are expected at the landing operations situated along the major streams and coastal zone.

Given the characteristics of settlement in the colonial period it is predicted that sites of this period will be located north and east of the project area. The Appoquinimink River-Drawyers Creek drainage area holds the highest potential for containing early historic archaeological sites although some may also be present in the Smyrna River - Duck Creek area as well.

By the middle of the 18th century, population increases and commercial expansion stimulated the growth of towns and the development of transportation and industry. During the 1730`s successful attempts were made to harness waterpower on the Brandywine and Christina Rivers resulting in the establishment of Wilmington as the foremost milling and shipping center in Delaware. The availability of wheat from the central Mid-Atlantic region, easy and economical transportation, and the proximity of the Philadelphia and New York markets facilitated the commercial rise of the Brandywine mills. During the later part of the 18th century Wilmington's economy focused on shipbuilding, coopering, milling, and import-export trade.

The rise of commerce and industry in Wilmington produced significant effects on the rural areas of New Castle and Kent counties. The technologies utilized in the Brandywine Valley spread to these areas resulting in a extensive network of mills throughout the colony. Millworks in the agrarian areas were frequently multi-functional with water-powered grist, saw and (woolen cloth) fulling operations being performed at different seasons at the same location. The mills primarily produced goods for local and non-local markets. At this time, the agrarian Delmarva Peninsula was considered an area of portage between the Chesapeake Bay markets (Annapolis and Baltimore) and the Delaware River and Bay markets (Philadelphia).

Settlement remained water-oriented during the Initial Agrarian Settlement Period (1682-1810) which includes numerous waves of settlement from Europe, Pennsylvania, and Maryland with settlements expanding up the navigable streams into headwater areas. Several examples of sites from this period are noted in the Appendix. A number of distinct settlement patterns are noted which reflect environmental and economic contraints. Ports, landings, and agricultural complexes were established where well-drained land was available on the Delaware River-Delaware Bay shore. Port Penn, on the Delaware River, became a major redistribution-shipping center for central Delaware. Kitts Hummock, St. Augustine Creek Landing, and Bowers Beach were port settlements located at the mouths of major streams during slightly later time periods.

The presence of extensive marshland at the mouths of streams and along their lower reaches resulted in the establishment of

inland landings and agricultural complexes. These settlement types were situated on the first available expanses of well-drained soils. All the inland settlements and landings established during this period in the proximity of the project area exhibit this pattern. They are: Red Lion on Red Lion Creek, Saint Georges on Saint Georges Creek; Cantwell's Bridge (now Odessa) on the Appoquinimink River; Taylor's Bridge Landing and Blackbird Landing on Blackbird Creek; Flemings Landing, Brick-store Landing, Smyrna Landing, and Smyrna on the Smyrna River; Whitehall Landing, Fast Landing, and Leipsic on the Leipsic River; Little Creek Landing on the Little River; Dover on the St. Jones River; and Frederica on the Murderkill River.

The western limits of settlement were the headwater areas of the navigable streams and their major tributaries during the early portions of this period. Very little settlement occurred in the extensive areas along drainage divides between watersheds although these lands were patented. Instead, settlement was restricted to land in close proximity to major waterways. Water routes were the keystone of the transportation system, although overland travel was increasing as a far-ranging network of roadways developed (see the Varlle and Shallus Map of 1802). Indeed, a regional road network existed by the 1720's between the Dover area, the northern part of the colony, and Maryland's Eastern Shore and some settlement may be expected along these roads. However, without a doubt, the major focus of early settlement during this period remained along the major drainages.

Commercial transportation was tied to water routes because they were more economical than overland transport of bulky

agricultural products (Middleton 1953). However, the movement of goods over short distances to processing and redistribution centers was often overland; especially in the inland hinterland. Intra-regional passenger travel between commercial centers and towns was facilitated by the development of the Philadelphia-Lewes postroad (modern Route 13). While road travel was difficult and time-consuming, it often offered more direct routes than the waterways, which were oriented toward the Delaware River-Delaware Bay and better suited to transport market - oriented produce. Earle (1975) has identified a similar pattern of road development and use in tidewater Maryland.

Agrarian settlement was predominant, however. During the 1720s towns were established at the junction of major transportation routes and many of the towns grew from landings and hamlets. The site locational data collected for the project area indicate three factors important in the siting of early towns: 1) the availibility of extensive areas of well-drained land; 2) proximity to a navigable stream; and 3) proximity to the Philadelphia-Lewes postroad (now Route 13/113), the Chesapeake Bay spur (now Route 301), or other road networks. These factors have also been noted by Wise (1979) and their importance demonstrated in historic site locational analyses (Custer and Bachman 1985). The towns of Red Lion, Saint Georges, Mt. Pleasant, Cantwell's Bridge (Odessa), Leipsic, Smyrna, Dover, Frederica, Canterbury, Camden, and Noxontown (which is no longer extant), all early 18th century towns, possess these locational characteristics. Locational data also indicate that the early

towns were situated at mid-drainage or further upstream settings (see Wise 1979). This pattern suggests that town sites were chosen near the heads of navigation of major streams and tributaries. The routing of the Philadelphia-Lewes postroad through the towns and the heads of navigation facilitated inland transportation and communication.

The siting of Middletown deviates from the patterns noted above because it is situated at the western edge of settlement on the drainage divide between the Appoquinimink River and Drawyers Creek watersheds. Its position on a major road to the eastern shore of Maryland, and at a terminus of numerous cartroads, encouraged its growth despite the absence of a navigable stream.

Towns were the loci of facilities for the storage and redistribution of agricultural surplus and processed goods. Population was concentrated in towns, although both population and town size were small. Documentary research on the activities in early Delaware towns has been limited, although the distribution of settlement types within the project area and more detailed data available for adjacent areas allows the delineation of town patterning.

Mercantile concerns, shops, stores, and public offices represent the major services available to town residents and hinterland populations (Lemon 1972; Reps 1972; Earle 1975; Kelly 1979; Wise 1979). Craftsmen, mill complexes and manufactories were outside towns. Early towns have been described by some researchers as "cities" or "urban" in character because they served the function of urban centers for the agricultural hinterlands (Earle 1975; Kelly 1979; Wise 1979; Henry 1981). It

is more likely that towns in the project area retained the characteristics of provincial towns well into the 19th century or later.

Farmsteads, plantations and estates were the predominant settlement type during this period and numerous archaeological examples are noted in the Appendix. They were present within the limits of settlement discussed earlier. Agricultural settlement was absent in the drainage divide areas. Because agricultural produce needed to be moved to processors or redistribution centers, agricultural settlements were 1) in close proximity to major streams and their tributaries or 2) along primary and secondary roads which linked the hinterland to landings and service centers. These trends are reflected in the probability zones noted on the attached maps. Landholdings were substantial in size and although extensive areas were settled, settlement density was low (see Varle and Shallus Map of 1802 - General Assembly of the State of Delaware 1899). Documentary research on landholdings in Maryland shows a mean plantation size of 430 acres (Kelly 1979). Kelly (1979) points out that land sales data suggest increases in settlement area and settlement density, when in fact, they reflect increases in individual landholdings as landowners' purchased adjacent tracts. Agricultural settlements contained a main house and a broad range of special function outbuildings, as well as residential quarters for tenants, agricultural laborers, servants, and slaves. In the 1750s, draining of marshland opened new areas to agricultural use in the lower reaches of Drawyers Creek, Appoquinimink River, and Leipsic

River.

Mill complexes and agricultural mill complexes were conspicuous features on the rural landscape. Their distribution was of course limited by the need for water; however, they were located consistently at mid-drainage settings or further upstream on major streams and their tributaries. It is likely these locations were chosen because they are at the heads of navigation. Mills generally were located outside town, but their stream settings offered access to transport facilities. Numerous secondary roads linked the processing centers to the agricultural hinterland. There was an absence of mills on the lower portions of the major drainages which suggests that some agricultural products may have been shipped unprocessed to markets. Interior produce apparently was processed and later transported to market, or processed goods were consumed by local markets and unprocessed surplus was shipped to outside markets.

Data on the distribution patterns of manufactories, the workshops of occupational specialists and other types of sites are very limited for the study area. Only one manufactory was identified for this period, although it fits the pattern recognized by researchers working in other areas. Like mills, manufactories and workshops were situated within the agricultural hinterland in order to be accessible to the agricultural community requiring their services (see Lemon 1972; Earle 1975; Kelly 1979; Wise 1979). Taverns were located along heavily travelled post and cart roads, most frequently at crossroads or junctions with landings and streams and are noted for the study area in the Appendix. Shifts in the usage of structures as

residences and taverns over time makes positive identification of taverns difficult. Generally taverns were spaced the distance an overland traveller could ride in one day, but often a traveller found shelter in a farmhouse along the route. Churches were located in towns and in rural settings. Rural churches were found on secondary roads accessible to the agricultural population.

A substantial number of sites of this period have been identified within the proposed project area (see Appendix and attached maps). More sites conforming to the settlement patterns and settlement types presented above are expected. The attached maps note the sensitivity zones for potential pre-1802 settlement based on the above settlement pattern analysis and also notes the few known pre-1802 sites. Saint Georges and Mt. Pleasant are the only towns established in the early 18th century in the vicinity of the proposed alignments. Many of the early 18th century ports, landing, plantations, and farmsteads lay outside the project area on the lower reaches of streams and on the Delaware River-Delaware Bay shore.

The early decades of the 19th century saw the beginning of an agricultural revolution throughout Delaware, most extensively in New Castle county. The first agricultural society in the United States was formed in New Castle county in 1804 with a strong focus on scientific agricultural practices. A number of factors worked in conjunction to establish New Castle county, and Delaware as a whole, as an important agricultural producer. The discovery of marl, a natural fertilizer, during the construction

of the Chesapeake and Delaware Canal in the 1820's enhanced the productivity of Delaware agriculture while the opening of the canal encouraged the production of market-oriented crops because produce could be quickly and cheaply transported to markets.

The opening of the Philadelphia, Wilmington and Baltimore Railroad in 1839 provided transportation of northern Delaware produce to the growing eastern markets. The extensive production of market-bound crops developed later in Kent and Sussex counties due to a lack of interior transportation facilities, although produce did move by water from seaport towns. When the Delaware Line extended rail service to Dover and later Seaford in the 1850's, a vast agricultural hinterland was opened and agricultural production for markets increased significantly.

Prior to 1832 Delaware's agricultural products were primarily grains, with fruit and vegetable crops of lesser importance. During the period 1832-1870 Delaware became the center for peach production in the eastern United States. Rich soil, favorable climate and rainfall, excellent transportation facilities, and strategic location near large markets made peach production a lucrative enterprise. Delaware City with its canal location led Delaware and New Castle county in production until the peach blight of the 1850's. The peach industry was hindered in Kent and Sussex counties until the 1850's due to transportation limitations. Early attempts there failed because producers could not move fruit to market economically. Rail service into the area and the absence of the peach blight in the southern counties made the peach industry economical in the 1850's.

By the end of the "peach boom", massive harvests were being shipped by rail and steamship lines to Philadelphia and Baltimore where much was readied for resale to the northern states. The peach industry proved profitable for a large number of peach growers, as well as a variety of support industries. Basket factories, canneries, and peach tree nurseries all aided in and reaped the financial rewards of the peach industry. The railroad and steamship lines integral to peach distribution, depended on peach shipment for a large portion of their annual revenue. The construction of "peach houses" of the Italianate architectural style took place at this time and peach houses are common in the project area as both standing structures and potential archaeological sites.

Through the 19th century, and into the 20th century, Delaware's agricultural production continued to focus on perishable products with a decrease in staples. There has been marked increase in milk and poultry production while the levels of fruit and vegetable production were maintained. Cash crops such as tobacco, have been of importance on a small scale in Kent and Sussex counties.

Throughout Delaware's agricultural history farm labor has been a valued commodity. In the colonial period blacks in slavery and white indentured servants were the primary farm laborers. By the mid-18th century white indentured servants were as numerous as black slaves. Slightly less than one-half of the blacks in the state in 1790 were free; however, by 1810, less than one-quarter of blacks were slaves according to federal

censuses. Therefore, in the 18th century, free black laborers played an increasing role in farm production. Abolitionist attitudes were strong in Delaware and legislation enacted by Quaker and Methodist leaders restricted the increase of slaveholding, especially in New Castle and Kent counties, by prohibiting the importation and exportation of slaves. Agricultural factors, as well, reduced the profitability of slaveholding and thus a combination of ethical and economic factors were responsible for the increase in the free black population in the state prior to Emancipation and the Civil War.

Major shifts in settlement patterning occurred within the project area during the full Agrarian Settlement Period (1810 - 1880) which is characterized by the development and growth of a local agricultural economy primarily in response to railroad and canal construction. Choices in settlement location were no longer constrained by water accessibility and major settlement expansion was felt in the upland zones between watersheds, especially on the high, well-drained soils along the drainage divide separating the Chesapeake Bay and Delaware River-Delaware Bay watersheds. This vast area contained agriculturally productive land, but the high cost of overland transportation had limited its value in earlier periods. In previously settled areas, unoccupied land on the drainage divides came into agricultural production. There was a continuation of the water-oriented settlement patterns established earlier because they remained economically viable. New roads linked the older transportation system and the newly established canal and railroad routes. The construction of the railroad and the canal,

however, was not the only factor in settlement expansion. Increasing population pressure in settled areas and the growing demand of the interregional markets for agricultural products made the construction of the new transportation routes economically feasible. The location of the railroad and canal had profound influence on the patterning of settlement into the 20th century. These patterns have been demonstrated by recent historic site location analyses (Custer and Bachman 1985).

Roads became more important as factors in settlement location as this period progressed. No longer were the major streams and primary roads the foci of settlement. An extensive network of roads was established in the newly settled agricultural hinterland and these roads linked farmsteads and agricultural hamlets to the redistribution centers and served to channel agricultural surplus from the hinterland to the large, domestic markets. Population growth and settlement density were highest between the Philadelphia-Lewes postroad and the railroad line which paralleled it to the west, the major axes of the proposed corridors. The major service centers within the study area were situated on one of these routes or on the canal.

The establishment of new towns and the growth of existing towns and hamlets was an important response to the new transportation corridors in that the new towns were not restricted by earlier environmental and economic constraints. Towns appear on the perimeters of watersheds and on drainage divides which were once obstacles to agricultural settlement and could never have supported town growth. Surrounding the new

towns was a large agricultural hinterland occupying similarly situated land.

Saint Georges was already important as a local center due to its position at the junction of a major north-south road and Saint Georges Creek. The canal enabled Saint Georges to increase its influence as a redistribution center and command a larger share of the growing agricultural surplus of the hinterland. Dover, Smyrna and Cantwell's Bridge (Odessa) emerged as intra-regional centers because rail, road and water transportation routes converged in these already established centers. These towns controlled extensive hinterlands and they provided a wide range of business and commercial services for the rural population. The broad range of services provided employment for the large, concentrated non-agricultural population. While these towns played increasingly important roles in the intra-regional economy, they were still subordinate to the inter-regional centers, Philadelphia, Baltimore, and Wilmington.

Local centers, such as Clayton, Townsend, Cheswold, Sassafras Station (Green Spring), Kenton, Wyoming, and Woodside, were established specifically to store and redistribute agricultural products. Middletown experienced heavy growth as a railroad town. Each of the towns exerted influence over a small rural hinterland and were also the loci of stores, banks, hotels, railroad stations, commercial offices, physician's offices, and post offices. The new towns exhibited regularized street plans and clearly defined residential and commercial districts. These patterns are not seen in older communities which developed by accretion.

The improvement of roadways encouraged additional settlement throughout the region. A primarily agrarian pattern of settlement consisting of farmsteads, workshops, manufactories, processing facilities, crossroad towns, churches, and schools were scattered along the primary and secondary roadways. The farmsteads were involved in market crop production and farm products were transported to nearby centers.

The substantial number of agricultural tenant dwellings and farms in the region indicates the presence of a large body of landless agricultural laborers. The distributional pattern of agricultural tenant-related structures in rural areas indicated the majority were situated close to the roadways (Custer and Bachman 1985). Further research is required to verify this pattern and to explain the differences in the distribution of tenant-related structures and the residences of the landed population.

Hamlets and villages were established at the intersection of secondary roads which connected the hinterland to local and intra-regional centers and major transportation routes. The crossroad town provided the hinterland population with a restricted set of services, usually a general merchandise store and less frequently workshops. They also served as the loci of small population clusters. The ubiquitous "Corners" are found throughout the study area. Crossroad towns did not appear at the junction of all roads, but only at the junction of roads leading to large centers or major transportation routes which exerted a "pull" on the hinterland products and the population requiring

the services of centers.

The majority of sites identified in the proposed project area date to this period. The settlement types discussed, excluding the intra-regional centers and most of the local centers, are present in high numbers in the project area and known locations are noted on the attached maps and listed in the Appendix.

No major changes in the settlement patterns established during the preceeding period occurred during the Settlement Stabilization and Agrarian Maintenance Period (1880-1910). The hierarchical structure of settlement types described in the previous section presisted. New centers did not develop during this period because the economic and environmental constraints operative earlier resulted in the siting of centers in highly advantageous locations. Subsequent technological and transportation improvements served only to increase the agricultural productivity of the hinterland and the spheres of influence of the local and intra-regional centers.

Population increases were significant within centers, but these are all outside the proposed project area. Few sites dating from this period have been identified; however, many of the sites established earlier continue to serve the same functions within the same settlement conditions.

Motorized transportation and upgrading of roads for automobile traffic encouraged distinctive settlement shifts during the Modern Period (1911-1950). Urban population growth continued and the concentration of commerce and industry increased. A more important shift was the expansion of a non-

agricultural population into rural areas. Primary and secondary roads became the foci of residential settlement and small parcels of land along the roads were carved from large farm properties for single family dwellings. The farmsteads generally remained behind the new residential front and the character of the region remained agrarian. New settlement types for this period are the non-agricultural residences and automobile-related facilities. The pattern of settlement is essentially a composite or mosaic of earlier patterns superimposed one upon the other.

The patterning and density of settlement in Delaware, and the study area specifically, have been strongly influenced by several factors throughout its history. These are: 1) an agrarain economy; 2) the commodity demands of large markets, first Europe and the West Indies, and later domestic commercial-industrial centers, and 3) transportation facilities. The advent of automobile transportation in the 20th century brought about significant improvements in the state road system and opened large tracts of land to productive agriculture. The Dupont Highway constructed in the 1920's linked the northern and southern sections of the state and shifted the agrarian focus of the southern counties permanently toward non-local markets.

RESEARCH QUESTIONS

Most of the Route 13 project area has been, and continues to be, an important agricultural area, and the study of the development of Delaware's agriculture provides a focus for historic archaeological research. For example, little is known

about the lower class of non-landed tenant farmers. Few of their dwellings survive and the historical record makes little reference to the role played by this group in the rural society. Most known agricultural tenant dwellings are of less substantial construction and appear to be situated near the roadsides of each farmstead, while the landowner's more imposing dwelling is located back from the road. How this is related to the agricultural community and the general social structure has not yet been explained.

As has been stated above numerous times, there has been a general shift through time from a subsistence to market agriculture. However, farm-specific and inter-farm preferences for marketable versus subsistence foodstuffs are poorly known. From primary documents like agricultural censuses, orphans court records, and deeds, some indication of regional agricultural preferences could be obtained and the overall pattern of agricultural land use could be better understood. The location analysis generated here could also be an important part of this research.

Related to both agriculture and settlement pattern is the question of farmstead design. How were the agricultural complexes laid out, what was the arrangement and function of outbuildings, where were the yard areas and how was each used, and, in a more general sense, where were the early farmsteads placed within each land parcel? Excavation of farmsteads can answer these questions. The relative importance of transportation, soils, markets, and other factors should be

studied further on a more site-specific basis to see how they influenced farmstead design and placement through time. It has also been shown that the "long-lot" system of land use was prevalent in the early historic period in Tidewater Maryland, and Virginia and it is postulated that it was also used in the project area. However, this remains to be demonstrated and a detailed study of early land records and plat maps would be required.

Transportation has always been an important consideration in the marketability of Delaware agricultural produce, and through time, various types of transportation have served that need. At the same time, the emphasis on each type has shifted and with it have come subtle changes in town development and size, rural settlement pattern, population density, and opportunities for light manufacturing and foodstuff processing. The general improvement of the transportation system also allowed for the appearance of some manufacturing in a number of towns in an otherwise highly agrarian economy. Pursuits like carriage-making, tanning, and peach processing were introduced. Very little of this activity is present today, most of it having presumably declined with changing market conditions. This aspect of the local economy has never been documented and future archaeological research could seek to reconstruct these activities.

The earliest forms of travel in the Route 13 corridor were probably by boat and on foot, as the few early roads were frequently unsuitable for cart travel. The heads of stream navigation became transshipment centers and thus foci of

settlement. During the 19th century, the establishment of adequate roads and then railroads altered the commercial pattern and emphasized the junctions of these later modes of travel. Hamlets grew up around road/railroad intersections and the importance of places like Blackbird Landing, Smyrna Landing, and Odessa was eclipsed by Blackbird Station, Clayton, and Middletown. Research within the proposed Rt. 13 Corridor should try to reveal the mechanisms of this change and document its ramifications for village life, commercial patterns, and population change. Not to be overlooked is the impact of the construction of the present Rt. 13 on the lifeways of the people of the Upper Delmarva Peninsula. This road, which essentially replaced an older Philadelphia to Lewes Post Road, drastically altered the traffic pattern on the Delmarva when it was opened in the early 1920s.

One of the features of the early road network was taverns or inns placed at intervals of approximately a day's ride along the major thoroughfares. If the establishment could be situated at a crossroads, so much the better. Research into the Buck Tavern, at Summit Bridge, Delaware (Wilkins and Quick, 1976) suggested that rural inns and taverns in Delaware were often ephemeral businesses which were licensed, but otherwise loosely defined, were often contained in farmhouses or dwellings only slightly modified for the purpose, and as a group are presently poorly documented. The analysis of such an establishment may present thorny problems for it is currently unknown how many inns and taverns have existed within the Rt. 13 Corridor. So far only

three such structures have been identified so far in the survey: one 18th century structure in Kenton Hundred and two 19th century examples in St. Georges Hundred.

Another aspect of the historic settlement pattern is the element of church building placement and the demographics of the supporting congregations. Churches were especially important gathering places for a variety of social events during the seventeenth and eighteenth centuries when they were often one of the first structures erected in the community. Furthermore, ministers were frequently the most literate individuals in the community and thus assumed leadership roles. Church records are valuable sources of demographic information, for they were often the only repository of personal records in newly settled areas which lacked strong local governments with record keeping facilities. These sorts of records should be examined for information on congregation size, areal extent, and the kinds of activities, both secular and ecclesiastical, conducted at the church site.

The black enclave south of Townsend, Delaware, known locally as "New Discovery", presents an opportunity to study a late 19th and 20th century rural ethnic community and its associated social structure. Areas of inquiry should include land tenure, land size and use for each landowner, land transferral practices, subsistence and cash crop growing practices, house type and preference and construction practices, and group identity and cohesion through time.

In sum, by evaluating the site-specific data available from the sites discovered during this study within broader research

questions, the significance of prehistoric and historic archaeological sites can be evaluated. Furthermore, analyses of these data can yield valuable insights on historic human behavior in the Delmarva region through time.

MANAGEMENT CONSIDERATIONS

Detailed statements of cultural resource management considerations are provided in a separate overview, but a few comments can be made here. The listings of known sites in the study area provided in the Appendix, and in the other planning studies, a partial statement of all of the historic sites in the project area alignments and can be viewed as a sample of the sites. For management purposes, it is necessary to use both the projected probability zones for pre-1802 sites and the site listings which are marked on the enclosed maps. The marked probability zones are based on the initial models reported by Custer et al. (1984: Attachment VI) and have been adjusted based on field testing and further analysis (Custer and Bachman 1985; Custer, Bachman, and Grettler 1986).

Table 2 provides an estimate of the percentage of the area of the alignment within each data link that falls within each probability zone and the number of known sites. These percentages and site counts can be used to estimate the relative amount of data recovery that might be required within any given data link. The high probability zones will not only have more sites, but they are also more likely to have more large sites eligible for listing on the National Register of Historic Places.

TABLE 2: Historic Archaeological Site Counts and Pre-1802 Probability Areas

Data Link	Site Count	% High Prob. (pre-1802)	% Low Prob (pre-1802)
A1.1	0	10	90
A1	13	80	20
A2	2	--	100
A3	0	--	100
A4	1	30	70
A5	0	10	90
A6	1	--	100
A7	0	25	75
A8	1	10	90
A9	1	40	60
B1	7	50	50
B2	27	100	--
B3	1	100	--
B4	2	100	--
B5	6	100	--
B6	10	--	100
B7	5	100	--
B8	3	100	--
B9	9	100	
B10	6	100	
B11	0	50	50
B12	0	50	50
B13	0	--	100
B14	0	--	100
B15	0	20	80
B16	0	100	--
B17	0	100	--
B18	0	100	--
B19	0	100	--
C1	1	90	10
C2	0	80	20
C3	5	20	80
C4	1	60	40
C5	0	50	50
C6	0	40	60
C7	0	100	--
C8	0	60	40
C9	0	50	50
C10	2	30	70
C11	0	80	20
X1	22	10	90
X2	1	20	80
X3	0	10	90
X4	1	20	80

Therefore, the high probability zones are the areas for significant prehistoric cultural resources. All known historic sites will require at least Phase II testing to determine their eligibility for listing on the National Register of Historic Places and many will also require Phase III data recovery excavations.

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Key to Symbols in Appendix

Historic Site Type Symbols

AGBLG - Agricultural Outbuilding

AGCX - Agricultural Complex

AGMCX - Agricultural-Mill Complex

AGTEN - Agricultural Tenant Dwelling/Farm

BRID - Bridge

CHUR - Church

DWCX - Dwelling Complex

GMCX - Gristmill Complex

INDTEN - Industrial Tenant

LANOP - Landing Operation

MANUFY - Manufactory

PEACH - Peach House

RRR - Railroad-related

RRSTA - Railroad Station

SCH - School

STRUC - Structure

TENANT - Tenant House

WKSH - Workshop

APPENDIX

HISTORIC ARCHAEOLOGICAL SITES ASSOCIATED WITH STANDING STRUCTURES

SITE NUMBER	DATA LINK	HUNDRED	DATE	FUNCTION	ARCH. POTENT.	SIG.
N5888	A1	APPOQUINIMINK	1868-1893	AGCX	Y	H
N4309	A1	APPOQUINIMINK	1849-1868	RRR	Y	M
N105	A1	SAINT GEORGES	P1849	AGCX	Y	H
N5849	A2	APPOQUINIMINK	L19THC	HOT	Y	M
N5847	A2	APPOQUINIMINK	1880	DWCX	Y	M
K3181	A4	KENTON	P1868	TENANT	Y	H
N5087	B1	RED LION	1849-1868	AGTEN	Y	H
N5053	B1	RED LION	P1849	AGCX	Y	H
N4275	B1	NEW CASTLE	C1920'S	BRID	Y	L
N5086	B1	NEW CASTLE	1849-1868	AGTEN	Y	H
K3151	B10	LITTLE CREEK	P1868	AGCX	Y	H
K3155	B10	LITTLE CREEK	M20THC	SERVST	Y	U
K1771	B10	LITTLE CREEK		DWCX	Y	U
K3164	B10	LITTLE CREEK	P1868	EST	Y	H
K1609	B10	LITTLE CREEK	C1840	AGCX	Y	H
N5181	B2	SAINT GEORGES	P1849	AGCX	Y	H
N5154	B2	SAINT GEORGES	1849-1868	DWCX	Y	H
N5249	B2	RED LION	1849-1868	AGCX	Y	H
N1235	B2	RED LION	1790	AGCX	Y	H
N3947	B2	SAINT GEORGES	1849-1868	AGCX	Y	H
N5187	B2	SAINT GEORGES	P1849	AGCX	Y	H
N1492	B2	RED LION	1800-1825	EST	Y	H
N5042	B2	RED LION	1825-1875	AGCX	Y	H
N5156	B2	SAINT GEORGES	P1849	AGCX	Y	H
N4291	B2	RED LION	1920-1929	BRID	Y	L
N5857	B5	APPOQUINIMINK	P1849	AGCX	Y	H
N6306	B6	BLACKBIRD	C1830	DWCX	Y	H
N6299	B6	BLACKBIRD	E20THC	DWCX	Y	M
N6303	B6	BLACKBIRD	E19THC	SCOSTA	Y	H
N6304	B6	BLACKBIRD	L19THC	DWCX	Y	M
N6300	B6	BLACKBIRD	L19THC	AGCX	Y	M
N6305	B6	BLACKBIRD	1800	DWCX	Y	H
N6309	B6	BLACKBIRD		SCH	U	U
N6302	B6	BLACKBIRD	L19THC	STO	Y	H
N6301	B6	BLACKBIRD	L19THC-E20TH	DWCX	Y	M
N6307	B6	BLACKBIRD		AGCX	U	U
N5265	B7	BLACKBIRD	1868-1893	AGCX	Y	M
N6271	B7	BLACKBIRD	P1849	AGCX	Y	H
K3847	B8	DUCK CREEK	1939	DWCX	Y	L
K3846	B8	DUCK CREEK	1939	DWCX	Y	L
K3826	B9	DUCK CREEK	E20THC	DWCX	Y	M
K3850	B9	DUCK CREEK	L19THC	AGCX	Y	H
K3830	B9	DUCK CREEK	L18THC	AGCX	Y	H
K3851	B9	DUCK CREEK	L19THC	DWCX	Y	M
N5938	C3	BLACKBIRD	P1849	AGCX	Y	H

SITE NUMBER	DATA LINK	HUNDRED	DATE	FUNCTION	ARCH. POTENT.	SIG.
N6232	X1	APPOQUINIMINK	M20THC	DWCX	Y	L
N6216	X1	APPOQUINIMINK		DWCX	U	U
N5880	X1	APPOQUINIMINK	1923	CHUR	Y	L
N6235	X1	APPOQUINIMINK	M20THC	DWCX	Y	L
N6219	X1	APPOQUINIMINK		DWCX	U	U
N6215	X1	APPOQUINIMINK	M20THC	DWCX	Y	L
N6234	X1	APPOQUINIMINK	M20THC	DWCX	Y	L
N6230	X1	APPOQUINIMINK	E20THC	DWCX	Y	M
N6229	X1	APPOQUINIMINK	C1900	DWCX	Y	M
N6228	X1	APPOQUINIMINK	M20THC	DWCX	Y	L
N6227	X1	APPOQUINIMINK	E20THC	DWCX	Y	M
N6231	X1	APPOQUINIMINK	M20THC	DWCX	Y	L
N6226	X1	APPOQUINIMINK	E20THC	DWCX	Y	M
N6218	X1	APPOQUINIMINK		DWCX	U	U
N6222	X1	APPOQUINIMINK	M20THC	DWCX	Y	L
N6221	X1	APPOQUINIMINK	C1950	DWCX	Y	L
N6220	X1	APPOQUINIMINK		DWCX	U	U
N6217	X1	APPOQUINIMINK	M20THC	DWCX	Y	L
N6223	X1	APPOQUINIMINK	E20THC	DWCX	Y	M
N6224	X1	APPOQUINIMINK	1920-1935	SCH	Y	L
N6225	X1	APPOQUINIMINK	E20THC	DWCX	Y	M
K238	X4	DUCK CREEK	1774	AGMCX	Y	H

POTENTIAL ARCHAEOLOGICAL SITES NOT ASSOCIATED WITH STANDING STRUCTURES

SITE NUMBER	DATA LINK	HUNDRED	DATE	FUNCTION	SITE POTENT.	SIG.
155	A1	SAINT GEORGES	1849-1868	DWCX	Y	H
42	A1	RED LION	1849-1868	AGTEN	Y	H
972	A1	SAINT GEORGES	1868-1893	RRSTA	Y	M
86	A1	SAINT GEORGES	1849-1868	AGTEN	Y	H
950	A1	SAINT GEORGES	1849-1868	AGTEN	Y	H
225	A1	APPOQUINIMINK	P1849	AGCX	Y	H
942	A1	SAINT GEORGES	1868-1893	AGTEN	Y	H
156	A1	SAINT GEORGES	1849-1868	DWCX	Y	H
904	A1	APPOQUINIMINK	1868-1893	AGTEN	Y	M
41	A1	RED LION	1849-1868	AGTEN	Y	H
716	A6	EAST DOVER	P1868	STRUC	Y	H
740	A8	NORTH MURDERKIL	P1868	AGCX	Y	H
759	A9	SOUTH MURDERKIL	P1802	MMCX	Y	H
1032	B1	RED LION	1849-1868	AGTEN	Y	H
1034	B1	RED LION	1849-1868	AGTEN	Y	H
1033	B1	RED LION	1849-1868	AGTEN	Y	H
596	B10	LITTLE CREEK	P1868	DWCX	Y	H
37	B2	RED LION	1849-1868	AGTEN	Y	H
116	B2	SAINT GEORGES	1849-1868	AGCX	Y	H
103	B2	SAINT GEORGES	P1849	AGTEN	Y	H
186	B2	SAINT GEORGES	P1849	SCH	Y	M

SITE NUMBER	DATA LINK	HUNDRED	DATE	FUNCTION	SITE POTENT.	SIG.
113	B2	SAINT GEORGES	P1849	STO	Y	H
33	B2	RED LION	P1868	AGTEN	Y	H
187	B2	SAINT GEORGES	1849-1868	DWCX	Y	H
37	B2	RED LION	1849-1868	AGTEN	Y	H
189	B2	SAINT GEORGES	1849-1868	DWCX	Y	H
188	B2	SAINT GEORGES	1849-1868	STRUC	Y	H
1041	B2	RED LION	1849-1868	AGTEN	Y	H
36	B2	RED LION	P1849	AGTEN	Y	H
1042	B2	RED LION	1868-1893	AGTEN	Y	M
35	B2	RED LION	P1849	AGTEN	Y	H
38	B2	RED LION	P1849	AGCX	Y	H
102	B2	SAINT GEORGES	P1849	BRID	Y	M
122	B2	SAINT GEORGES	1849-1868	AGCX	Y	H
914	B3	SAINT GEORGES	1868-1893	AGTEN	Y	M
847	B4	APPOQUINIMINK	1849-1868	PO	Y	H
1052	B4	APPOQUINIMINK	1849-1868	WKSH	Y	H
842	B5	APPOQUINIMINK	1849-1868	AGTEN	Y	H
843	B5	APPOQUINIMINK	1868-1893	DWCX	Y	M
886	B5	APPOQUINIMINK	1849-1868	AGCX	Y	H
844	B5	APPOQUINIMINK	1868-1893	DWCX	Y	M
285	B5	APPOQUINIMINK	P1849	AGTEN	Y	H
792	B7	BLACKBIRD	1868-1893	AGCX	Y	M
340	B7	BLACKBIRD	P1849	AGTEN	Y	H
405	B7	BLACKBIRD	P1849	AGCX	Y	H
923	B8	DUCK CREEK	P1868	AGTEN	Y	H
448	B9	DUCK CREEK	P1868	AGTEN	Y	H
447	B9	DUCK CREEK	P1868	SCH	Y	M
463	B9	DUCK CREEK	P1868	AGCX	Y	H
475	B9	DUCK CREEK	P1868	AGTEN	Y	H
476	B9	LITTLE CREEK	1802-1850	GMCX	Y	H
284	C1	APPOQUINIMINK	P1849	AGCX	Y	H
648	C10	LITTLE CREEK	P1868	AGTEN	Y	H
690	C10	EAST DOVER	P1868	CHUR	Y	M
425	C3	BLACKBIRD	1849-1868	AGCX	Y	H
327	C3	BLACKBIRD	1849-1868	AGCX	Y	H
325	C3	BLACKBIRD	1849-1868	AGTEN	Y	H
326	C3	BLACKBIRD	P1849	SCH	Y	M
416	C4	BLACKBIRD	1849-1868	AGCX	Y	H
327	X1	BLACKBIRD	1849-1868	AGCX	Y	H
327	X2	BLACKBIRD	1849-1868	AGCX	Y	H

HISTORIC STANDING STRUCTURE CULTURAL RESOURCES OF THE ROUTE 13 RELIEF ROUTE CORRIDOR

Wade P. Catts

INTRODUCTION

There are 320 standing structures dated prior to 1940 which are presently known to be located in the Route 13 corridor within 2000 feet on either side of the proposed alignments. Approximately 60 structures will be directly impacted. The remaining 260 structures are considered in this overview because they will be subject to indirect effects such as visual, noise, or air pollution. An inventory of the standing structures in the corridor is provided in Appendix I. Appendix I includes the Cultural Resource Survey number designation of the structure, the Hundred in which it is located, the construction date, material of construction, and the function(s) of the structure.

Appendix II contains an inventory of the standing structures in the project area, arranged by their alignment segments. This appendix lists the CRS designation, the Hundred location, and the alignment segment within which the structure is found. In several cases, structures have more than one section number, indicating their presence in other alignments. The total number of structures that are found in each alignment are noted in Table 3.

An overview of the major architectural styles that exist in the alignments is presented below. Integrated into the architectural overview is a discussion of the major historic

TABLE 3

Railroad Alignment: Odessa Segment

SECTION NUMBER	NUMBER OF STRUCTURES	NOTES
A1	31	Excludes Middletown, Townsend
A1.1	1	
	Smyrna Segment	
A2	14	
A3	4	
A4	19	Excludes Clayton
A5	7	
	Dover Segment	
A6	8	
A7	14	
A8	36	
A9	22	
A9.1	6	

Upgrade Alignment: Odessa Segment

B1	7	
B2	31	
B3	4	Excludes Odessa
B4	7	
B5	5	
	Smyrna Segment	
B6	11	
B7	8	
B8	8	Excludes Smyrna
B9	24	
	Dover Segment	
B10	10	Excludes Dover
B11	--	
B12	--	
B13	25	
B14	4	
B15	8	Excludes everything south of Woodside
B16	--	
B17	--	
B18	1	
B19	10	

Near West/Near East Alignment:		Odessa Segment
C1	3	
		Smyrna Segment
C2	1	
C3	6	
C4	19	
C5	3	
C6	1	
		Dover Segment
C7	0	
C8	6	
C9	0	
C10	1	
Crossovers:		
X1	6	
X2	0	
X3	6	
X4	4	

Totals:
Railroad Alignment = 142 Structures
Upgrade Alignment = 163 Structures
Near West/Near East Alignment = 40 Structures
Crossovers = 16 Structures

events of the region and the standing structures which are related to those historic periods. A discussion of specific types and functions of standing structures and their significance is also presented. Finally, several tentative research questions that can be addressed during later phases of research dealing with specific standing structures are outlined.

OVERVIEW

The following overview is abstracted primarily from Herman (1982), Del Sordo (1984),Glassie (1968, 1969, 1972), Eckman et al. (1938), Hoffecker (1973, 1977), Munroe (1978), Passmore (1978), and Hancock (1976). A complete listing of sources consulted for this report can be found in the bibliography.

The state of Delaware is made up of three contiguous historic architectural building zones, the boundaries of which are neither definite nor distinct. These zones are northern New Castle County, all of Sussex and the southern portions of Kent County, and southern New Castle County and northern Kent County. This last zone contains the Route 13 project corridor and all of its various alignments. The vernacular building styles in this central region of the state are the results of influences from several different architectural source areas, including southern Pennsylvania, southwest New Jersey, the central eastern shore of Maryland, eastern Sussex County, and the upper eastern shore of Virginia. This overview of the dominant architectural styles present in the project area is set out in a chronological manner. It is divided into the following periods: prior to 1700, from 1700 to 1810, from 1810 to 1880, 1880 to 1920, and from 1920 to the present. These time periods roughly correspond to the time periods used in the discussion of the historic archaeological resources of Route 13 and are also congruent with a periodization scheme developed by the staff of the Delaware State Historic Preservation Office.

Pre-1700

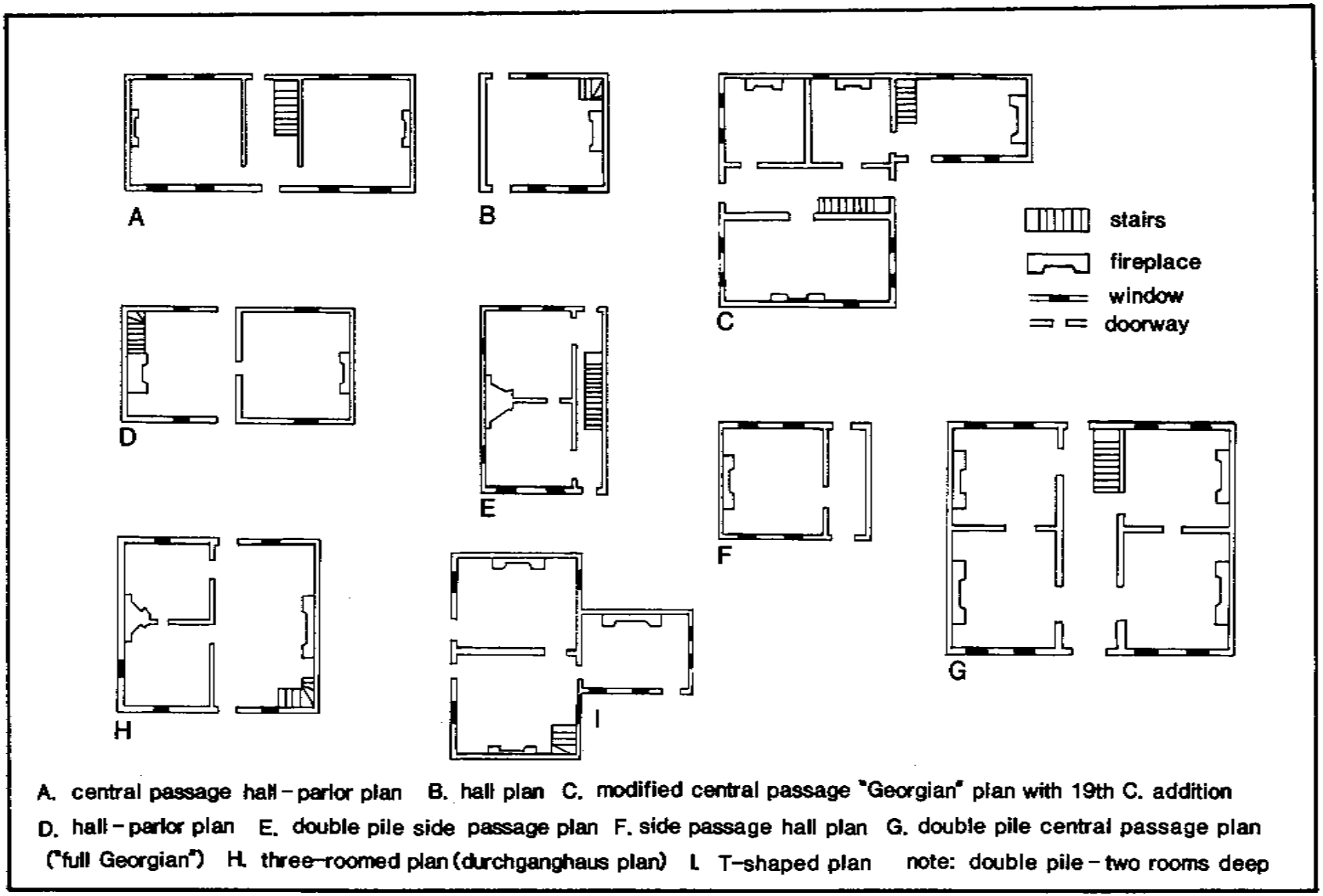
No dwellings or buildings that date from the early settlement periods of the region (1630s to 1690s) are extant in the project area. An engineering structure from this period, a portion of a Dutch causeway and bridge (N1309), does exist at the Route 13 crossing of Drawyer's Creek.

1700 to 1810

This time period may be divided into sub-periods; however, due to the paucity of structures from this time period in the study area, it will be considered as one unit. Settlement during the early decades of this period was confined mainly to those areas where water transportation was most readily available. Consequently, structures dating to the first quarter of the 18th century were most often located on the first fast land west of the Delaware River. Few of these dwellings survive today. There are three dwellings that may date from the first quarter of the century in the project area. Two are located in New Castle County (N102, N123), and one in Kent County (K955). All three examples are of brick construction.

The remaining decades of the 18th century, and the first quarter of the 19th century are much better represented by the extant built environment. Excluding the three dwellings mentioned above, there are a total of twenty examples of vernacular architecture from this period in the alignments. These 18th century survivors are typically of brick construction, two stories in elevation, and built on hall, hall-parlor, center or single passage, single-pile plans (see Figure 6). Other

FIGURE 6
Examples of Typical House Plans in the Route 13 Study Area



A. central passage hall – parlor plan B. hall plan C. modified central passage "Georgian" plan with 19th C. addition D. hall – parlor plan E. double pile side passage plan F. side passage hall plan G. double pile central passage plan ("full Georgian") H. three-roomed plan (durchganghaus plan) I. T-shaped plan note: double pile – two rooms deep

plans, such as cross-passage or double-pile, may have been constructed, but there are no surviving examples. The Georgian style became more popular by the end of the 18th century, but houses constructed in pure Georgian form were rare. Many surviving forms constructed in the last decades of the century, such as the McDonough House (N424), represent the adaptability and longevity of earlier vernacular forms.

This period also saw the advent of the 4-bay Pennsylvania farmhouse type, and modification of the hall-parlor plan, or I-house, from the Chesapeake region. The Pennsylvania plan is a synthetic plan that on the exterior appears Georgian, but in actuality is a three-room plan. The dominant characteristics of the I-house are its one-room deep plan and windowless gable ends. All of these forms, with the exception of the I-house plan, would dominate vernacular architecture in the project area until the first decades of the 20th century.

The overwhelming majority of structures and dwellings built during this time period were constructed of log. Yet, 50% of the survivals in the alignments from this period are constructed of brick. These log houses were most probably built on one or two room plans, were 1 to 1 1/2 stories in elevation, with interior gable end chimneys, and earth-fast or post-in ground foundations. In the project area, only one log structure, located in North Murderkill Hundred (K246), survives from this period. The remainder of the survivors built at this time are of timber framing or frame construction.

All of the farmsteads or "plantations" during this period would have had a myriad of surrounding support structures and

outbuildings, such as kitchens, granaries, barns, bakehouses, smoke and meathouses, stables, barrocks, chickenhouses, and privies. No 18th century examples of these types of structures survive in the project alignments.

1810 to 1880

During this time period, the rural Delaware landscape encompassed in the project area underwent several dramatic economic, social, and agricultural changes that profoundly effected the built environment. A century and a half of poor agricultural and farming practices on the part of Delaware husbandmen had served to severely reduce the productivity of the farms. Many farmers, unable to maintain their lands and their livelihoods, abandoned the land for the fast-growing cities, or moved West, towards new and better lands. This exodus of the population resulted in the re-allocation and redistribution of farm lands in the area, from many small independent farmers, to fewer, large landholders. The majority of these large landowners employed hired laborers and tenants to work their farms.

These hard times began to come to an end during the second quarter of the 19th century, when new agricultural methods, such as improved crop rotation, fertilizers, and the use of machinery, began to make the lands of southern New Castle County and adjacent Kent County extrememly bountiful, productive, and desirable. By mid-century, new and improved modes of transportation, such as the Chesapeake and Delaware Canal, the Delaware Railroad, and better roads, had made it easier and cheaper to move the produce of the farms and orchards to urban

markets. At about the same time, peaches became the dominant export crop from the area, and remained so until the end of the period.

All of these changes contributed to the architectural building, altering, and rebuilding that swept through the project area. The zenith of this period occurred in the decades between 1840 and 1860, but it began as early as 1820 and lasted until about 1870. This construction activity was widespread and all-encompassing. For example, Herman (1982:185) has found that every surviving structure or dwelling in St. Georges Hundred had additions constructed, trim added, or was rebuilt during this period.

There are 148 standing structures that date from this period in the project corridor. Most of these are altered earlier structures, but there are also completely new buildings. In contrast to the earlier period, new houses were often built with centrally-placed stair passages and were usually a full two stories in elevation. By 1870, kitchen and service ells attached to the rear of the houses were the rule, as opposed to seperate structures. Thus, plans of these dwellings often have the appearances of 'T' or 'L' shapes (see Figure 6). As previously noted, the persistence of Georgian, Pennsylvania, and I-house forms continued in this period. The former two began to gradually replace the later throughout the period, but all three were popular house plans. In most cases, new or contemporary architectural elements and features were simply appended to or overlaid on existing forms. Thus trim,box cornices, and

pediments for windows and doors were reflective of Classical Revival, Federal, and Victorian architectural styles.

Many of the surviving structures have Classical Revival features, such as K3938, or Federal features, like N1492. These structures are typically of frame or brick construction. Other architectural elements are also present on the survivors, such as Greek Revival, Gothic Revival (N5045), and Victorian (K1075, K1198). A large number of these dwellings were tied to the rise of peach production and are known as "peach houses". These structures show a combination of late Federal, Greek Revival, Second Empire, and Moorish architectural features. Two examples of peach houses in the alignments are N5152 and N121, a fine example of Greek Revival and Italianate designs. Both are located in St. Georges Hundred.

Outbuildings during this period reflected the changes in agricultural practices in the region. In some cases structures were often multi-purpose in function, but generally outbuildings and support structures retained similar uses to those that they had had in the 18th century. Often the house and outbuildings were arranged in a hollow square or court yard pattern characteristic of New Jersey farms. Others were laid out on a linear plan, termed the Linear Mid-Atlantic Farm Plan by Glassie (1972). These plans were oriented in a variety of fashions, usually facing south, but often affected by the location of roads, lanes, streams, and other man-made and natural environmental features. There are numerous examples of agricultural and dwelling complexes throughout the alignments,

many containing examples of outbuildings that date from this period.

1880 to 1920

This period is representative of a hiatus that occurred in building and construction in the project area. Grain production in the area had declined by the last decades of the 19th century, and orchard crops, after the advent of the "peach yellows" disease, reached a nadir by 1890. Little construction was undertaken during this period. Truck or market garden farming became an important occupation, and the project area supplied many urban centers, such as Baltimore, Wilmington, and Philadelphia, with fresh produce. The completion of the DuPont Highway in 1924 (present-day Route 13) stimulated this industry by adding a new transportation method, in addition to water and rail, by which to move the produce to market.

Architectural features found on houses of this period include Victorian, Queene Anne, Folk Victorian, Colonial Revival, and Neoclassical elements. As with the earlier periods, the Georgian form or modifications of it persisted until the end of this period as the dominant vernacular plan.

Only 54 structures date to this period in the project area. The overwhelming majority of these are located in Kent County and are of frame construction. This may represent a localized period of demographic and economic growth, as the period was historically one of consistent economic good fortune for Kent County. Only three structures in both counties are brick.

1920 to Present

The construction of the DuPont Highway gave impetus to renewed growth in the project area. This road, which in many places followed the route of the old 18th century King's Highway, opened up new areas for construction of business and commercial enterprises. In a similar fashion, the use of the automobile gave rise to the erection of support facilities and service stations for its use, such as N5877 and K3155. The majority of this construction was confined to strips along Route 13, and had little effect on the surrounding countryside, which is still predominantly agricultural. The rural nature of the landscape is deceptive, however, as most of the land is now corporately owned.

Fifty-four structures are present in the alignments that have construction dates from this period. The majority of these are located in Kent County and are frame structures. Concrete and cinderblock construction are also present, particularly in outbuildings and support structures. New architectural forms, such as Craftsman, Neoeclectic, and Modern types, have been introduced into the project area, but it is still dominated by middle to late 19th century forms.

SIGNIFICANCE OF SPECIFIC TYPES OF STANDING STRUCTURES

Delaware is fortunate in that all of the pre-1945 standing structures in the study area have been identified and inventoried. In addition, the state has compiled an Historic American Building Survey catalog (Morton, in press) which lists many of the standing structures in the Route 13 alignments. This

resource should be consulted when questions concerning specific structures arise.

The largest number of standing structures in the project area are frame and brick structures that date to the 1820 to 1870 period. Predominant among these are agricultural complexes, and dwelling complexes. In many cases these complexes contain some of the support structures and outbuildings that were present on the farmsteads of this period. These are significant resources, as they illustrate the relationship between the main house and the outbuildings of the farms during the 19th century, in regards to location, orientation, and function.

Structures from the 17th and 18th centuries are the most under-represented in the alignments. A bias towards brick dwellings is shown in the number of survivors from this period. The one log structure in Kent County (K246) is an especially significant resource due to the lack of log survivors, and their predominancy in the 18th century. In general, structures and complexes dating from this period are significant resources because of their small number. As with later periods, those complexes where outbuildings survive are of extreme importance, because they show above-ground relationships among structures from the 18th century, a time prior to the agricultural and social reforms that occurred after 1820.

Later period standing structures (1870 to the present) represent a period of economic change in the region. Although they appear more modern and thus "less historic" than earlier structures, they played important roles in the development of industrial, agricultural, commercial, and residential life in

central Delaware. The majority of these structures are found along Route 13 itself, and its tributary roads, and are related to the growth and development of those transportation routes.

In many ways, the landscape today is much less built-up than it was a century earlier. By the middle of the 19th century, a large number of central Delaware farms were operated as tenant properties. In many cases, between three and five tenant houses, with their own set of support structures and outbuildings, would be found on the farm, in addition to the owner's residence and outbuildings. Documentary and court records show these tenant housesoften to have been located along the farm lanes and roads surrounding the properties, and away from the main house.

At least 27 of these agricultural tenant structures and complexes survive in the project area (see inventory). These types represent an often impermanent house type whose occupants were generally of lower social status than the farm owners. Tenant structures were an integral part of rural society in central Delaware prior to the 20th century. Many of the tenants who worked these farms were free blacks, particularly in Kent County, which had a higher percentage of free blacks prior to the Civil War than did the rest of Delaware. In some cases, blacks resided in small, segregated, rural communities, such as Charley Town or New Discovery near Townsend (N6306).

In addition to tenancies, grain and lumber mills (N102, K238, K3743, and K833) were present along the major drainages and served the local population as centers of commerce. Also located on the drainages were transshipment points, or landings,

such as Smyrna Landing (K202, K4012-4014), and Blackbird Landing. These locations acted as social and commercial centers for the surrounding countryside, and also as ties to larger urban markets, such as Philadelphia and Wilmington. These landings were often small towns, containing manufacturing, commercial, and residential structures. The populations of these communities were often watermen who made their livings on the Delaware Bay and its tributaries; a lifestyle that is fast vanishing in Delaware. The development of new transportation methods, particularly the Delaware Railroad and Route 13, contributed to the decline of these water-oriented communities.

The religious diversity of the central Delaware population can be seen in the number of churches and cemeteries in the alignments. Some of these have early dates associated with their use, such as Old Saint Annes (N124), the St. Georges Cemetery (N5041), and the Old United Methodist Church in Appoquinimink Hundred (N423). In total there are nine such sites in the alignments. In addition to their architectural integrity, the scarcity and age of these sites, and, in the case of the cemeteries, their social and ethical contexts, make the cultural significance of these sites obvious.

The transportation history of the region is represented by several structures in the corridor. Besides the 17th century Dutch causeway at Drawyer's Creek (N1309), there are two road bridges of 20th century construction: N4275 in New Castle Hundred and N4291 in Red Lion Hundred. Both are recent reconstructions of earlier spans. Neither are particularly significant, given the large number of bridges of similar types throughout the

state.

Transportation history is also represented by the presence of four railroad related structures. One is a railroad bridge that crosses Deep Creek south of Middletown (N4309). The other structures are at Forest Station, and were the station, hotel, post office, and store of that depot (N5848, N5849, N5851). All are interrelated to the history of that small community. These sites are significant in that they illustrate the impact of the transportation revolution, from water to rail, that entered the region in the middle of the 19th century, and brought with it ecomonic changes that effected rural society.

The growth of public supported education and educational opportunities in central Delaware are represented by five sites in the project area. Most of these -- N6309, N5925, K3795, and K2685 -- are examples of rural one-room schoolhouse architecture. This type of structure, after it functioned as a school, was usually modernized and altered to serve as a residence. Thus these buildings usually retain little of their original architectural integrity. Important among these sites, however, are the buildings comprising the St. Joseph's Industrial School complex near Clayton (K5051-5055). This industrial school was established in 1896 for black students, and the buildings extant include a chapel, dormitories, workhouses, and school buildings. The establishment of this school for minority education and its cluster of related frame buildings make this resource culturally significant.

Two other structures related to public support and maintenance are the Kent County Almshouses, both located in North

Murderkill Hundred. K246, although now destroyed, was on the location of an earlier late 18th century almshouse, and had seperate facilities for white and black inmates. This site has potential for both archaeological and historical value. K3751 is a mid-19th century frame structure. Both of these sites are culturally significant in that they are representative of an aspect of society that is rarely seen or studied, but was all too commonplace in 18th and 19th century rural America.

RESEARCH QUESTIONS

The preceeding sections have presented an overview of the major architectural styles in the project area, along with a discussion of the major historical events of the region, and a general review of the different types of standing structures and their significance. To address specific structures or types of structures, some basic research questions can be developed to aid in future studies. The study of vernacular architecture draws upon many fields of the social sciences, such as anthropology, history, cultural geography, folklore, and sociology. All of these, including vernacular architecture and the study of standing structures, are concerned with the study and explication of patterns of human behavior. The following questions have as a basis this same concern.

In all of the historic periods, an important type of resource to study is the complexes of buildings in the alignments. These can be the obvious agricultural, dwelling and tenant complexes, as well as complexes related to commercial and

transshipment activities, such as Smyrna Landing, or transportation complexes, like the cluster of railroad-related structures at Forest Station. The major issues of research to be addressed by the study of these complexes are how did these complexes change over time, both on intrasite and intersite levels? Is it possible to determine if the changes observed were related to regional trends -- economics, politics, agriculture, environment -- or to site specific changes, such as changes in inhabitants at the complex -- new owners, tenants?

In regards to the "clusters" such as Smyrna Landing and Forest Station, questions concerning those centers' relationships with their hinterlands can be asked. Where were their hinterlands? Did they have one? How large were they? What population comprised them?

The rural community, including farms, tenancies, manufactories, mills, schools, churches, taverns, wharves, depots, stagecoach stops, and hotels, should be the major focus of future research questions asked in the Route 13 corridor. Only through the study of how all of these individual sites interrelate and react, diachronically and synchronically, can a more complete picture of central Delaware's cultural heritage be developed.

In addition to broad questions concerning the built environment, architectural queries can also be asked of specific standing structures. In general, research at standing structures can address questions of how American vernacular architecture was reflective of the society that produced it, and how that

architecture influenced its society. Research into North Carolina's vernacular builders by Carl Lounsbury (1982) is one approach to this question.

Little is known about non-high style American architects. In the project area, questions addressing who these carpenters, joiners, and craftsmen were, what they constructed, and its spatial and temporal variablitiy could be asked, using the standing structures in the corridor as a data base. Are stylistic differences apparent in the area, and are they reflective of the builder of the house? Can specific structures be identified with individual carpenters, based on the architectural techniques and elements found in the house?

Other specific standing structure research could be aimed at the study of the household -- or family unit -- and its relationship to its home. As the nature of the household changed over time, the plan and structure of the home -- center hall, side hall, hall-parlor plans, one or two rooms deep, kitchen ells, story additions -- changed as well. Were these alterations a result simply of changing familial sizes and architectural styles, or do they represent an emerging consciousness of spatial and functional specialization and differentiation within the household? Addressing questions of this nature could effect the study of men's and women's roles in the home, and the popular identification of certain areas of the house as a "woman's sphere" or a "man's sphere". Recent archaeological studies (Mrozowski 1984) into the household would be of value in the study of households through vernacular architecture.

These research questions are of a tentative nature, but can be utilized as guides for future studies of standing structures in the alignments. Research must be inter-disciplinary and oriented towards a holistic study of the built environment in all of its aspects. The study of standing structures, whether on an intrasite or intersite basis, is a primary and integral source of information for this research.

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Key to the Abbreviations used in the Appendix

AGBLG - Agricultural Outbuilding
AGCX - Agricultural Complex
AGMCX - Agricultural-Mill Complex
AGTEN - Agricultural Tenant Dwelling/Farm
ALMHSE - Almshouse
BANK - Bank
BRID - Bridge
BSSH - Blacksmith/Wheelwright Shop
CAUWY - Causeway
CCBLG - Canal Company Building
CEM - Cemetary
CHUR - Church
COMM - Commercial Structure
DWCX - Dwelling Complex
EST - Estate
GMCX - Gristmill Complex
GOVBLG - Government Building
HISTD - Historic District
HOT - Hotel
INDTEN - Industrial Tenant
LANOP - Landing Operation
LMKILN - Lime Kiln
LTHSE - Lighthouse
MANUFY - Manufactory
MMCX - Multiple-Mill Complex
MWHSE - Migrant Worker House
PEACH - Peach House
PEAORC - Peach Orchard
PHYS - Physician's House
PLANT - Plantation
PO - Post Office
RR - Railroad Bed
RRR - Railroad-related
RRSTA - Railroad Station
RT - Race Track
SCH - School
SCOSTA - Stagecoach Station
SERVST - Service Station
SLAVQ - Slave Quarters
SMCX - Sawmill Complex
SOMCX - Sorghum Mill Complex
STO - Store
STRUC - Structure
TAV - Tavern, Inn
TENANT - Tenant House
VESSEL - Vessel (sunken)
WARE - Warehouse
WKDW - Worker Dwelling
WKSH - Workshop

APPENDIX I
INVENTORY OF STANDING STRUCTURE CULTURAL RESOURCES IN THE ROUTE 13 PROJECT CORRIDOR

CRS	HUNDRED	DATE	MATERIAL	FUNC	FUNC
N102	APPOQUINIMINK	C1720	BRICK	AGMCX	
N123	APPOQUINIMINK	E18THC	BRICK	AGCX	PLANT
N124	APPOQUINIMINK	1768	BRICK	CHUR	CEM
N423	APPOQUINIMINK	1847	BRICK	CHUR	CEM
N4309	APPOQUINIMINK	1849-1868	STEEL	RRR	BRID
N5844	APPOQUINIMINK	P1849	FRAME	AGCX	
N5845	APPOQUINIMINK	P1849	FRAME	AGCX	
N5846	APPOQUINIMINK	P1849	FRAME	AGCX	
N5847	APPOQUINIMINK	1880	FRAME	DWCX	
N5848	APPOQUINIMINK	1849-1868		RRSTA	PO
N5849	APPOQUINIMINK	L19THC	FRAME	HOT	RRR
N5850	APPOQUINIMINK	P1868	TIMBER	DWCX	
N5851	APPOQUINIMINK	P1868		RRSTA	STO
N5852	APPOQUINIMINK	1868-1893		DWCX	
N5853	APPOQUINIMINK		FRAME	DWCX	
N5854	APPOQUINIMINK	P1849	LOG	AGCX	
N5855	APPOQUINIMINK	P1849	FRAME	AGCX	
N5856	APPOQUINIMINK	P1849	FRAME	AGTEN	
N5857	APPOQUINIMINK	P1849	FRAME	AGCX	
N5874	APPOQUINIMINK			STRUC	
N5877	APPOQUINIMINK	1932	FRAME	MANUFY	SERVST
N5878	APPOQUINIMINK	P1849		AGCX	
N5879	APPOQUINIMINK	1849-1868	FRAME	AGTEN	
N5880	APPOQUINIMINK	1923	FRAME	CHUR	
N5885	APPOQUINIMINK	P1849	FRAME	AGCX	
N5887	APPOQUINIMINK	P1849	LOG	AGCX	
N5888	APPOQUINIMINK	1868-1893	FRAME	AGCX	
N5889	APPOQUINIMINK	P1868	FRAME	AGTEN	
N5896	APPOQUINIMINK		FRAME	STRUC	
N5898	APPOQUINIMINK	P1849		AGCX	
N5902	APPOQUINIMINK	P1849	FRAME	AGBLG	
N5903	APPOQUINIMINK	1826	FRAME	AGCX	
N5928	APPOQUINIMINK	P1849	BRICK	MANUFY	AGCX
N132	BLACKBIRD	1800	FRAME	AGCX	
N4154	BLACKBIRD	L18THC	FRAME	AGCX	
N4155	BLACKBIRD	1849-1868	FRAME	AGCX	
N4246	BLACKBIRD	1849-1868	FRAME	AGCX	
N5265	BLACKBIRD	1868-1893	FRAME	AGCX	
N5937	BLACKBIRD		FRAME	CHUR	
N5938	BLACKBIRD	P1849	FRAME	AGCX	
N6270	BLACKBIRD	P1849	FRAME	AGCX	
N6271	BLACKBIRD	P1849	FRAME	AGCX	
N6272	BLACKBIRD	P1849	TIMBER	AGCX	
N6273	BLACKBIRD	1893-1906	FRAME	AGCX	
N6274	BLACKBIRD	P1849	FRAME	AGCX	
N6281	BLACKBIRD	P1868	FRAME	AGCX	
N6290	BLACKBIRD	P1868		AGTEN	
N6299	BLACKBIRD	E20THC	TIMBER	DWCX	
N6300	BLACKBIRD	L19THC	TIMBER	AGCX	

APPENDIX I (cont.)
INVENTORY OF STANDING STRUCTURE CULTURAL RESOURCES
IN THE ROUTE 13 PROJECT CORRIDOR

CRS	HUNDRED	DATE	MATERIAL	FUNC	FUNC
N6301	BLACKBIRD	L19THC-E20TH	TIMBER	DWCX	
N6302	BLACKBIRD	L19THC	TIMBER	STO	HOT
N6303	BLACKBIRD	E19THC	TIMBER	SCOSTA	HOT
N6304	BLACKBIRD	L19THC	TIMBER	DWCX	
N6305	BLACKBIRD	1800	TIMBER	DWCX	
N6306	BLACKBIRD	C1830	LOG	DWCX	
N6307	BLACKBIRD		TIMBER	AGCX	
N6309	BLACKBIRD		TIMBER	SCH	
N6312	BLACKBIRD	1870-1880	TIMBER	AGCX	
N6313	BLACKBIRD	P1868	TIMBER	AGCX	
N6314	BLACKBIRD	P1868		AGCX	
N6315	BLACKBIRD	1849-1868		EST	AGCX
K156	DUCK CREEK	1741	BRICK	EST	
K202	DUCK CREEK	P1849		LANOP	
K236	DUCK CREEK	C1800	BRICK	EST	AGMCX
K238	DUCK CREEK	1774	BRICK	AGMCX	
K3826	DUCK CREEK	E20THC	FRAME	DWCX	
K3827	DUCK CREEK	E20THC	FRAME	DWCX	
K3828	DUCK CREEK	E20THC	FRAME	DWCX	
K3829	DUCK CREEK	E20THC	FRAME	AGCX	STO
K3830	DUCK CREEK	L18THC	FRAME	AGCX	
K3831	DUCK CREEK	1930	CONCRETE	DWCX	
K3832	DUCK CREEK	1930	FRAME	DWCX	
K3833	DUCK CREEK	1940	FRAME	GOVBLD	
K3834	DUCK CREEK	L19THC	FRAME	DWCX	
K3835	DUCK CREEK	C1950	FRAME	DWCX	
K3836	DUCK CREEK	M19THC	FRAME	AGCX	
K3837	DUCK CREEK	1925	FRAME	AGCX	
K3838	DUCK CREEK	1938	FRAME	DWCX	
K3839	DUCK CREEK	1938	FRAME	DWCX	
K3840	DUCK CREEK	C1850	FRAME	AGTEN	
K3841	DUCK CREEK	1922	CONCRETE	AGTEN	
K3846	DUCK CREEK	1939	FRAME	DWCX	
K3847	DUCK CREEK	1939	FRAME	DWCX	
N3848	DUCK CREEK	1935	FRAME	AGTEN	
K3849	DUCK CREEK	1850	FRAME	AGCX	
K3850	DUCK CREEK	L19THC	FRAME	AGCX	
K3851	DUCK CREEK	L19THC	FRAME	DWCX	
K3852	DUCK CREEK	C1945	FRAME	AGCX	
K3853	DUCK CREEK		BRICK	DWCX	
K3854	DUCK CREEK	C1890	FRAME	DWCX	
K3855	DUCK CREEK		FRAME	DWCX	
K3856	DUCK CREEK	P1868	FRAME	AGCX	
K3857	DUCK CREEK	P1868	FRAME	AGCX	
K3938	DUCK CREEK	1740	FRAME	AGCX	
K3939	DUCK CREEK	L19THC	FRAME	AGTEN	
K3940	DUCK CREEK	P1868	FRAME	AGCX	
K4012	DUCK CREEK	M19THC	FRAME	DWCX	
K4013	DUCK CREEK	C1800	FRAME	DWCX	

APPENDIX I (cont.)
INVENTORY OF STANDING STRUCTURE CULTURAL RESOURCES
IN THE ROUTE 13 PROJECT CORRIDOR

CRS	HUNDRED	DATE	MATERIAL	FUNC	FUNC
K4014	DUCK CREEK	E-M19THC	FRAME	DWCX	
K4015	DUCK CREEK	E-M19THC	FRAME	DWCX	
K4016	DUCK CREEK	C1940	FRAME	DWCX	
K4017	DUCK CREEK	E-M19THC	FRAME	DWCX	
K4018	DUCK CREEK	M-L19THC	FRAME	DWCX	
K4019	DUCK CREEK	E-M19THC	FRAME	DWCX	
K4020	DUCK CREEK	M19THC	FRAME	DWCX	
K4021	DUCK CREEK		FRAME	DWCX	
K4022	DUCK CREEK	1846	FRAME	PO	STO
K4023	DUCK CREEK	E-M19THC	FRAME	DWCX	
K4024	DUCK CREEK	E-M19THC	FRAME	DWCX	
K909	EAST DOVER	L19THC		CEM	
K1020	EAST DOVER	C1865C	FRAME	AGCX	
K1021	EAST DOVER		FRAME	AGCX	
K1022	EAST DOVER	1865	FRAME	AGCX	
K1024	EAST DOVER		FRAME	AGCX	
K1027	EAST DOVER		FRAME	AGCX	
K1029	EAST DOVER	1925-1935	FRAME	AGCX	
K1037	EAST DOVER	C1860	FRAME	CHUR	
K1038	EAST DOVER		FRAME	AGCX	
K1045	EAST DOVER	P1868	FRAME	AGCX	
K1046	EAST DOVER	C1900	FRAME	DWCX	
K1047	EAST DOVER	C1853	LOG	STO	AGCX
K1048	EAST DOVER		FRAME	AGCX	
K1049	EAST DOVER	P1868	FRAME	AGCX	
K1050	EAST DOVER	C1910	FRAME	AGCX	
K1065	EAST DOVER	1885	FRAME	AGCX	
K1075	EAST DOVER		FRAME	DWCX	
K1084	EAST DOVER	C1760	BRICK	AGCX	
K1087	EAST DOVER	1870	FRAME	AGCX	
K1322	KENTON	1949	FRAME	AGCX	
K1326A	KENTON	P1868	FRAME	AGCX	
K1326B	KENTON	P1868	FRAME	AGTEN	
K1333	KENTON	P1868	BRICK	AGCX	
K1344	KENTON	L19THC	FRAME	AGCX	
K1375	KENTON	1876	BRICK	AGCX	
K1378	KENTON	P1868	FRAME	AGTEN	
K1383	KENTON	P1868	FRAME	AGCX	
K1389	KENTON	C1850	FRAME	AGCX	
K3169	KENTON	C1935	FRAME	DWCX	
K3181	KENTON	P1868	FRAME	TENANT	
K5051	KENTON	1896		CEM	
K5052	KENTON	1880-1890	FRAME	SCH	AGBLD
K5053	KENTON	1880-1890	FRAME	SCH	AGBLD
K5054	KENTON	1896	FRAME	CHUR	
K5055	KENTON	1890-1920	FRAME	SCH	
K5157	KENTON	1942	FRAME	MANUFY	
K5158	KENTON	1943	CONCRETE	MANUFY	
K833	LITTLE CREEK	P1868	FRAME	GMCX	

APPENDIX I (cont.)
INVENTORY OF STANDING STRUCTURE CULTURAL RESOURCES
IN THE ROUTE 13 PROJECT CORRIDOR

CRS	HUNDRED	DATE	MATERIAL	FUNC	FUNC
K860	LITTLE CREEK	P1868	BRICK	AGCX	
K1613	LITTLE CREEK	P1868	FRAME	AGTEN	
K1627	LITTLE CREEK	P1868	FRAME	AGTEN	
K1628	LITTLE CREEK	P1868	FRAME	AGTEN	
K1771	LITTLE CREEK		FRAME	DWCX	
K1772	LITTLE CREEK	P1868	FRAME	AGCX	
K2063	LITTLE CREEK	P1868	FRAME	AGCX	
K2064	LITTLE CREEK		FRAME	AGCX	
K2065	LITTLE CREEK	E20THC	FRAME	MWHSE	
K2066	LITTLE CREEK	P1868	FRAME	AGTEN	
K3151	LITTLE CREEK	P1868	FRAME	AGCX	
K3152	LITTLE CREEK		FRAME	DWCX	
K3153	LITTLE CREEK	L19THC	FRAME	DWCX	
K3154	LITTLE CREEK	P1868	FRAME	AGCX	
K3155	LITTLE CREEK	M20THC	FRAME	SERVST	STO
K3156	LITTLE CREEK	L19THC	FRAME	DWCX	
K3162	LITTLE CREEK	1934	FRAME	DWCX	
K3163	LITTLE CREEK	P1868	FRAME	AGCX	
K3164	LITTLE CREEK	P1868	FRAME	EST	AGCX
N4275	NEW CASTLE	C1920'S		BRID	
N5085	NEW CASTLE	20THC	FRAME	AGCX	
N5086	NEW CASTLE	1849-1868		AGTEN	
K246	NORTH MURDERKILL	1740	LOG	AGCX	
K320	NORTH MURDERKILL	P1850	BRICK	ALMHSE	
K2032	NORTH MURDERKILL	18THC	FRAME	AGNCX	
K3540	NORTH MURDERKILL		FRAME	DWCX	
K3543	NORTH MURDERKILL	P1868	FRAME	AGCX	
K3544	NORTH MURDERKILL	1912	FRAME	AGCX	
K3547	NORTH MURDERKILL	E20THC	FRAME	AGCX	
K3548	NORTH MURDERKILL		FRAME	AGCX	
K3549	NORTH MURDERKILL	1880-1890	FRAME	AGCX	
K3550	NORTH MURDERKILL	P1868	FRAME	AGCX	
K3561	NORTH MURDERKILL	C1850	FRAME	AGCX	
K3563	NORTH MURDERKILL	M19THC	FRAME	AGCX	
K3564	NORTH MURDERKILL	1928	FRAME	AGCX	
K3566	NORTH MURDERKILL		BRICK	DWCX	
K3567	NORTH MURDERKILL	1868-1906	FRAME	AGCX	
K3734	NORTH MURDERKILL	L19THC	FRAME	AGCX	
K3736	NORTH MURDERKILL	E20THC	FRAME	AGCX	
K3737	NORTH MURDERKILL	E-M19THC	FRAME	AGCX	
K3738	NORTH MURDERKILL	1933	FRAME	AGCX	
K3741	NORTH MURDERKILL	P1868	FRAME	AGTEN	
K3742	NORTH MURDERKILL	P1868	FRAME	AGCX	
K3743	NORTH MURDERKILL	E20THC	FRAME	AGMCX	
K3744	NORTH MURDERKILL	P1868	FRAME	AGCX	
K3745	NORTH MURDERKILL	L19THC	FRAME	AGCX	
K3751	NORTH MURDERKILL	P1850C	FRAME	ALMHSE	
K3752	NORTH MURDERKILL	E20THC	TIMBER	AGBLG	
K3753	NORTH MURDERKILL	1925	FRAME	AGCX	

APPENDIX I (cont.)
INVENTORY OF STANDING STRUCTURE CULTURAL RESOURCES
IN THE ROUTE 13 PROJECT CORRIDOR

CRS	HUNDRED	DATE	MATERIAL	FUNC	FUNC	FUNC
K3754	NORTH MURDERKILL	C1860	FRAME	AGCX		
K3755	NORTH MURDERKILL	E20THC	FRAME	DWCX		
K3791	NORTH MURDERKILL	1930	FRAME	AGCX		
K3794	NORTH MURDERKILL	C1900	FRAME	DWCX		
K3795	NORTH MURDERKILL	L19THC	FRAME	DWCX	SCH	
K3796	NORTH MURDERKILL	E19THC	FRAME	DWCX		
K3808	NORTH MURDERKILL	L19THC	FRAME	AGCX		
K3809	NORTH MURDERKILL	1864	FRAME	AGCX		
K3810	NORTH MURDERKILL	L19THC	FRAME	DWCX		
K3811	NORTH MURDERKILL	L19THC	FRAME	DWCX		
K3812	NORTH MURDERKILL	L19THC	FRAME	DWCX		
K3813	NORTH MURDERKILL	L19THC	FRAME	DWCX		
K3814	NORTH MURDERKILL	L19THC	FRAME	DWCX		
K3816	NORTH MURDERKILL	L19THC	FRAME	DWCX		
K3817	NORTH MURDERKILL	1935	FRAME	DWCX		
K3818	NORTH MURDERKILL	1930	FRAME	DWCX		
N142	RED LION	1892	BRICK	EST	AGCX	
N144	RED LION	1792-1815	BRICK	EST	PHYS	
N499	RED LION	1840		DWCX		
N500	RED LION	C1844		DWCX	SCOSTA	
N1235	RED LION	1790	BRICK	AGCX		
N1491	RED LION	P1849	BRICK	AGCX		
N1492	RED LION	1800-1825	BRICK	EST		
N1493	RED LION	1836	BRICK	EST	AGCX	
N1565	RED LION	C1840'S		EST	SCH	
N3964	RED LION	C1850	BRICK	PLANT		
N4291	RED LION	1920-1929	CONCRETE	BRID		
N5037	RED LION	P1849	FRAME	AGCX		
N5038	RED LION	1825-1850	FRAME	AGCX		
N5041	RED LION	1698	BRICK	CHUR	CEM	DWCX
N5042	RED LION	1825-1875	FRAME	AGCX		
N5042A	RED LION	1849-1868	FRAME	AGTEN		
N5043	RED LION	P1849	FRAME	AGCX		
N5044	RED LION			AGCX		
N5045	RED LION	1849-1868		DWCX		
N5046	RED LION	1849-1868		DWCX		
N5047	RED LION	1849-1868		DWCX		
N5053	RED LION	P1849		AGCX		
N5087	RED LION	1849-1868		AGTEN		
N5249	RED LION	1849-1868		AGCX		
N105	SAINT GEORGES	P1849		AGCX		
N111	SAINT GEORGES	1849-1868	FRAME	AGCX		
N121	SAINT GEORGES	1860	BRICK	PEACH		
N3935	SAINT GEORGES	C1750	BRICK	AGCX		
N3947	SAINT GEORGES	1849-1868	FRAME	AGCX		
N5143	SAINT GEORGES	1860	FRAME	DWCX	STO	
N5146	SAINT GEORGES	C1870'S	BRICK	AGCX	EST	
N5151	SAINT GEORGES	P1849		AGCX		
N5152	SAINT GEORGES	1849-1868	BRICK	PEACH	PEAORC	

APPENDIX I (cont.)
INVENTORY OF STANDING STRUCTURE CULTURAL RESOURCES
IN THE ROUTE 13 PROJECT CORRIDOR

CRS	HUNDRED	DATE	MATERIAL	FUNC	FUNC
N5153	SAINT GEORGES	1849-1868	LOG FRAME	AGCX	
N5154	SAINT GEORGES	1849-1868	FRAME	DWCX	
N5160	SAINT GEORGES	1849-1868		AGCX	
N5181	SAINT GEORGES	P1849		AGCX	
N5182	SAINT GEORGES	C1860'S	FRAME	DWCX	STO
N5183	SAINT GEORGES	P1849	FRAME	EST	
N5187	SAINT GEORGES	P1849	FRAME	AGCX	
N5188	SAINT GEORGES	P1849		AGCX	
N5189	SAINT GEORGES	P1849		AGCX	
N5196	SAINT GEORGES	P1849		AGCX	
N5198	SAINT GEORGES	P1849	FRAME	AGCX	
N5201	SAINT GEORGES	1849	FRAME	AGCX	
N5202	SAINT GEORGES				
N5208	SAINT GEORGES	P1849	FRAME	AGCX	
N5216	SAINT GEORGES	P1849	FRAME	AGTEN	
N5235	SAINT GEORGES	1849-1868		AGTEN	
N5236	SAINT GEORGES	1849-1868	FRAME	AGCX	
N5240	SAINT GEORGES	1849-1868	FRAME	AGTEN	
N5241	SAINT GEORGES	1849-1868	FRAME	AGTEN	
N5242	SAINT GEORGES	1868-1893	FRAME	AGBLG	
N5244	SAINT GEORGES	C1775	BRICK	AGCX	
N5246	SAINT GEORGES	P1849		AGCX	
K1689	SOUTH MURDERKILL	P1868	FRAME	AGCX	
K2712	SOUTH MURDERKILL	C1860	FRAME	AGCX	
K2739	SOUTH MURDERKILL	P1868	FRAME	AGCX	
K2740	SOUTH MURDERKILL		FRAME	DWCX	
K2741	SOUTH MURDERKILL	P1868	FRAME	AGCX	
K2745	SOUTH MURDERKILL	P1868	FRAME	AGCX	
K2746	SOUTH MURDERKILL	L19THC	FRAME	AGCX	
K2753	SOUTH MURDERKILL		FRAME	STRUC	
K2754	SOUTH MURDERKILL	M19THC	FRAME	DWCX	
K3131	SOUTH MURDERKILL	M19THC	FRAME	AGCX	
K1197	WEST DOVER		FRAME	DWCX	
K1198	WEST DOVER	C1830	FRAME	AGCX	
K1199	WEST DOVER	P1868	FRAME	AGCX	
N5925	APPOQUINIMINK	1849-1868	FRAME	SCH	AGCX
K3218	NORTH MURDERKILL	P20THC	FRAME	TENANT	
K3220	NORTH MURDERKILL		FRAME	AGBLG	
K3347	NORTH MURDERKILL	E. 20THC	FRAME	DWCX	
K3348	NORTH MURDERKILL	E. 20THC	FRAME	DWCX	
K3349	NORTH MURDERKILL	E. 20THC	FRAME	DWCX	
K3350	NORTH MURDERKILL	E. 1890	FRAME	TENANT	
K3352	NORTH MURDERKILL	P1945	FRAME	AGCX	
K3353	NORTH MURDERKILL	P1945	FRAME	AGTEN	
K3354	NORTH MURDERKILL	C1890	FRAME	AGCX	
K3568	NORTH MURDERKILL	L. 19THC	FRAME	AGCX	
K3569	NORTH MURDERKILL	A1868	FRAME	DWCX	
K3570	NORTH MURDERKILL	L. 19THC	FRAME	DWCX	

APPENDIX I (cont.)
INVENTORY OF STANDING STRUCTURE CULTURAL RESOURCES
IN THE ROUTE 13 PROJECT CORRIDOR

CRS	HUNDRED	DATE	MATERIAL	FUNC
K3576	NORTH MURDERKILL	E. 20THC	FRAME	DWCX
K3577	NORTH MURDERKILL	E20THC	FRAME	DWCX
K3578	NORTH MURDERKILL	E20THC	FRAME	DWCX
K3579	NORTH MURDERKILL	P1868	FRAME	DWCX
K3580	NORTH MURDERKILL	P1868	FRAME	DWCX
K3581	NORTH MURDERKILL	P1868	FRAME	CHUR
K3820	NORTH MURDERKILL	L. 19THC	FRAME	DWCX
K137	SOUTH MURDERKILL	C1771	BRICK	AGCX
K248	SOUTH MURDERKILL	L. 18THC		CEM
K2674	SOUTH MURDERKILL	P1868	FRAME	DWCX
K2675	SOUTH MURDERKILL	P1868	FRAME	DWCX
K2676	SOUTH MURDERKILL	P1868	FRAME	DWCX
K2677	SOUTH MURDERKILL	P1868	FRAME	DWCX
K2678	SOUTH MURDERKILL	P1768	FRAME	AGCX
K2685	SOUTH MURDERKILL	C1930	FRAME	SCH
K2686	SOUTH MURDERKILL	P1868	FRAME	AGTEN
K2726	SOUTH MURDERKILL	M. 19THC	FRAME	AGCX
K2752	SOUTH MURDERKILL	E. 20THC	FRAME	DWCX
K902	EAST DOVER	C1860	FRAME	AGCX
K955	LITTLE CREEK	1700	BRICK	AGCX
K1001	LITTLE CREEK	C1910	FRAME	DWCX
K3351	NORTH MURDERKILL	1873	FRAME	AGCX
K3571	NORTH MURDERKILL	A1880	FRAME	DWCX
K3572	NORTH MURDERKILL	P1930	FRAME	CHUR
K3573	NORTH MURDERKILL	E20THC	FRAME	DWCX
K3574	NORTH MURDERKILL	L. 19THC	FRAME	DWCX
K3575	NORTH MURDERKILL	A1868	FRAME	AGCX

APPENDIX II
STANDING STRUCTURE CULTURAL RESOURCES IN THE ROUTE 13 PROJECT ALIGNMENTS, ARRANGED BY HIGHWAY SEGMENTS

		CRS	HUNDRED
A1		N102	APPOQUINIMINK
A1		N105	SAINT GEORGES
A1		N121	SAINT GEORGES
A1		N123	APPOQUINIMINK
A1		N124	APPOQUINIMINK
A1		N142	RED LION
A1		N4309	APPOQUINIMINK
A1		N5037	RED LION
A1		N5038	RED LION
A1		N5041	RED LION
A1		N5043	RED LION
A1		N5143	SAINT GEORGES
A1		N5146	SAINT GEORGES
A1		N5152	SAINT GEORGES
A1		N5153	SAINT GEORGES
A1		N5182	SAINT GEORGES
A1		N5183	SAINT GEORGES
A1		N5188	SAINT GEORGES
A1		N5189	SAINT GEORGES
A1		N5216	SAINT GEORGES
A1		N5235	SAINT GEORGES
A1		N5236	SAINT GEORGES
A1		N5240	SAINT GEORGES
A1		N5241	SAINT GEORGES
A1		N5242	SAINT GEORGES
A1		N5844	APPOQUINIMINK
A1		N5845	APPOQUINIMINK
A1		N5928	APPOQUINIMINK
A1	B2	N1492	RED LION
A2		N5846	APPOQUINIMINK
A2		N5847	APPOQUINIMINK
A2		N5848	APPOQUINIMINK
A2		N5849	APPOQUINIMINK
A2		N5850	APPOQUINIMINK
A2		N5851	APPOQUINIMINK
A2		N5852	APPOQUINIMINK
A2		N5853	APPOQUINIMINK
A2		N5854	APPOQUINIMINK
A2		N6274	BLACKBIRD
A2	X1	N5878	APPOQUINIMINK
A2	X1	N5887	APPOQUINIMINK
A2	X1	N5888	APPOQUINIMINK
A2	X1	N5896	APPOQUINIMINK
A3		N6290	BLACKBIRD
A3		N6312	BLACKBIRD
A3		N6313	BLACKBIRD

APPENDIX II (cont.)
STANDING STRUCTURE CULTURAL RESOURCES IN THE
ROUTE 13 PROJECT ALIGNMENTS, ARRANGED BY HIGHWAY SEGMENTS

		CRS	HUNDRED
A3		N6314	BLACKBIRD
A4		K1322	KENTON
A4		K1326A	KENTON
A4		K1326B	KENTON
A4		K1333	KENTON
A4		K1378	KENTON
A4		K1389	KENTON
A4		K3181	KENTON
A4		K3854	DUCK CREEK
A4		K3855	DUCK CREEK
A4		K3856	DUCK CREEK
A4		K3857	DUCK CREEK
A4		K5051	KENTON
A4		K5052	KENTON
A4		K5053	KENTON
A4		K5054	KENTON
A4		K5055	KENTON
A4		K5157	KENTON
A4		K5158	KENTON
A4		N4154	BLACKBIRD
A4		N4155	BLACKBIRD
A5		K1375	KENTON
A5		K1383	KENTON
A5		K1628	LITTLE CREEK
A5	X3	K1627	LITTLE CREEK
A5	X4	K3169	KENTON
A5	X4	K860	LITTLE CREEK
A6		K1038	EAST DOVER
A6		K1045	EAST DOVER
A6		K1046	EAST DOVER
A6		K1047	EAST DOVER
A6		K1048	EAST DOVER
A6		K1049	EAST DOVER
A6		K1050	EAST DOVER
A7		K1027	EAST DOVER
A7		K1029	EAST DOVER
A7		K1084	EAST DOVER
A7	A6	K1037	EAST DOVER
A8		K1020	EAST DOVER
A8		K1021	EAST DOVER
A8		K1022	EAST DOVER
A8		K1024	EAST DOVER
A8		K1065	EAST DOVER
A8		K1075	EAST DOVER
A8		K1087	EAST DOVER
A8		K1197	WEST DOVER
A8		K1198	WEST DOVER
A8		K1199	WEST DOVER

APPENDIX II (cont.)
STANDING STRUCTURE CULTURAL RESOURCES IN THE
ROUTE 13 PROJECT ALIGNMENTS, ARRANGED BY HIGHWAY SEGMENTS

				CRS	HUNDRED
A8				K2032	NORTH MURDERKILL
A8				K246	NORTH MURDERKILL
A8				K320	NORTH MURDERKILL
A8				K3734	NORTH MURDERKILL
A8				K3736	NORTH MURDERKILL
A8				K3737	NORTH MURDERKILL
A8				K3738	NORTH MURDERKILL
A8				K3741	NORTH MURDERKILL
A8				K3742	NORTH MURDERKILL
A8				K3743	NORTH MURDERKILL
A8				K3744	NORTH MURDERKILL
A8				K3745	NORTH MURDERKILL
A8				K3751	NORTH MURDERKILL
A8				K3752	NORTH MURDERKILL
A8				K3753	NORTH MURDERKILL
A8				K3754	NORTH MURDERKILL
A8				K3755	NORTH MURDERKILL
A8				K3791	NORTH MURDERKILL
A8				K3794	NORTH MURDERKILL
A8				K3795	NORTH MURDERKILL
A8				K3796	NORTH MURDERKILL
A8	A9.1			K3817	NORTH MURDERKILL
A8	A9.1	B14		K3816	NORTH MURDERKILL
A8	A9.1	B14	B15	K3813	NORTH MURDERKILL
A8	A9.1	B15		K3814	NORTH MURDERKILL
A8	X3			K1772	LITTLE CREEK
A9				K1689	SOUTH MURDERKILL
A9				K2712	SOUTH MURDERKILL
A9				K2739	SOUTH MURDERKILL
A9				K2740	SOUTH MURDERKILL
A9				K2741	SOUTH MURDERKILL
A9				K2745	SOUTH MURDERKILL
A9				K2746	SOUTH MURDERKILL
A9				K2752	SOUTH MURDERKILL
A9				K2753	SOUTH MURDERKILL
A9				K2754	SOUTH MURDERKILL
A9				K3131	SOUTH MURDERKILL
A9				K3540	NORTH MURDERKILL
A9				K3543	NORTH MURDERKILL
A9				K3544	NORTH MURDERKILL
A9				K3547	NORTH MURDERKILL
A9				K3548	NORTH MURDERKILL
A9				K3549	NORTH MURDERKILL
A9				K3550	NORTH MURDERKILL
A9				K3563	NORTH MURDERKILL
A9				K3564	NORTH MURDERKILL
A9				K3566	NORTH MURDERKILL
A9	B14			K3567	NORTH MURDERKILL
A9.1				K3818	NORTH MURDERKILL

APPENDIX II (cont.)
STANDING STRUCTURE CULTURAL RESOURCES IN THE
ROUTE 13 PROJECT ALIGNMENTS, ARRANGED BY HIGHWAY SEGMENTS

		CRS	HUNDRED
B1		N1491	RED LION
B1		N1565	RED LION
B1		N3964	RED LION
B1		N4275	NEW CASTLE
B1		N5053	RED LION
B1		N5085	NEW CASTLE
B1		N5086	NEW CASTLE
B1		N5087	RED LION
B10		K1001	LITTLE CREEK
B10		K3151	LITTLE CREEK
B10		K3152	LITTLE CREEK
B10		K3153	LITTLE CREEK
B10		K3154	LITTLE CREEK
B10		K3155	LITTLE CREEK
B10		K3156	LITTLE CREEK
B10		K3162	LITTLE CREEK
B10	C8	K1771	LITTLE CREEK
B10	C8	K955	LITTLE CREEK
B13		K3218	NORTH MURDERKILL
B13		K3220	NORTH MURDERKILL
B13		K3347	NORTH MURDERKILL
B13		K3348	NORTH MURDERKILL
B13		K3349	NORTH MURDERKILL
B13		K3350	NORTH MURDERKILL
B13		K3351	NORTH MURDERKILL
B13		K3352	NORTH MURDERKILL
B13		K3353	NORTH MURDERKILL
B13		K3354	NORTH MURDERKILL
B13		K3569	NORTH MURDERKILL
B13		K3570	NORTH MURDERKILL
B13		K3571	NORTH MURDERKILL
B13		K3572	NORTH MURDERKILL
B13		K3573	NORTH MURDERKILL
B13		K3574	NORTH MURDERKILL
B13		K3575	NORTH MURDERKILL
B13		K3576	NORTH MURDERKILL
B13		K3577	NORTH MURDERKILL
B13		K3578	NORTH MURDERKILL
B13		K3579	NORTH MURDERKILL
B13		K3580	NORTH MURDERKILL
B13		K3581	NORTH MURDERKILL
B13		K3820	NORTH MURDERKILL
B14		K3568	NORTH MURDERKILL
B15		K3561	NORTH MURDERKILL
B15		K3808	NORTH MURDERKILL
B15		K3810	NORTH MURDERKILL
B15		K3811	NORTH MURDERKILL
B15		K3812	NORTH MURDERKILL
B15	A8	K3809	NORTH MURDERKILL

APPENDIX II (cont.)
STANDING STRUCTURE CULTURAL RESOURCES IN THE
ROUTE 13 PROJECT ALIGNMENTS, ARRANGED BY HIGHWAY SEGMENTS

	CRS	HUNDRED
B18	K902	EAST DOVER
B19	K137	SOUTH MURDERKILL
B19	K248	SOUTH MURDERKILL
B19	K2674	SOUTH MURDERKILL
B19	K2675	SOUTH MURDERKILL
B19	K2676	SOUTH MURDERKILL
B19	K2677	SOUTH MURDERKILL
B19	K2678	SOUTH MURDERKILL
B19	K2685	SOUTH MURDERKILL
B19	K2686	SOUTH MURDERKILL
B19	K2726	SOUTH MURDERKILL
B2	N1235	RED LION
B2	N144	RED LION
B2	N1493	RED LION
B2	N3935	SAINT GEORGES
B2	N3947	SAINT GEORGES
B2	N4291	RED LION
B2	N499	RED LION
B2	N500	RED LION
B2	N5042	RED LION
B2	N5042A	RED LION
B2	N5044	RED LION
B2	N5045	RED LION
B2	N5046	RED LION
B2	N5047	RED LION
B2	N5151	SAINT GEORGES
B2	N5154	SAINT GEORGES
B2	N5160	SAINT GEORGES
B2	N5181	SAINT GEORGES
B2	N5187	SAINT GEORGES
B2	N5196	SAINT GEORGES
B2	N5198	SAINT GEORGES
B2	N5201	SAINT GEORGES
B2	N5202	SAINT GEORGES
B2	N5208	SAINT GEORGES
B2	N5244	SAINT GEORGES
B2	N5246	SAINT GEORGES
B2	N5249	RED LION
B3	N111	SAINT GEORGES
B4	N5874	APPOQUINIMINK
B4	N5877	APPOQUINIMINK
B4	N5885	APPOQUINIMINK
B4	N5889	APPOQUINIMINK
B4	N5898	APPOQUINIMINK
B4	N5902	APPOQUINIMINK
B4	N5903	APPOQUINIMINK
B5	N5855	APPOQUINIMINK
B5	N5856	APPOQUINIMINK
B5	N5925	APPOQUINIMINK

APPENDIX II (cont.)
STANDING STRUCTURE CULTURAL RESOURCES IN THE
ROUTE 13 PROJECT ALIGNMENTS, ARRANGED BY HIGHWAY SEGMENTS

			CRS	HUNDRED
B5			N5937	BLACKBIRD
B5			N6299	BLACKBIRD
B5			N6300	BLACKBIRD
B5			N6301	BLACKBIRD
B5			N6302	BLACKBIRD
B5			N6303	BLACKBIRD
B5			N6304	BLACKBIRD
B5			N6305	BLACKBIRD
B5			N6306	BLACKBIRD
B5			N6307	BLACKBIRD
B5			N6309	BLACKBIRD
B5	C1		N423	APPOQUINIMINK
B5	C1	X1	N5880	APPOQUINIMINK
B6			N5265	BLACKBIRD
B6			N6281	BLACKBIRD
B6	C2		N6270	BLACKBIRD
B6	C3		N6271	BLACKBIRD
B6	C3		N6272	BLACKBIRD
B6	C3		N6273	BLACKBIRD
B6	C4		N6315	BLACKBIRD
B7			K156	DUCK CREEK
B7			K3838	DUCK CREEK
B7			K3839	DUCK CREEK
B7			K3840	DUCK CREEK
B7			K3841	DUCK CREEK
B7			K3846	DUCK CREEK
B7			K3847	DUCK CREEK
B7			N3848	DUCK CREEK
B8			K236	DUCK CREEK
B8			K3826	DUCK CREEK
B8			K3827	DUCK CREEK
B8			K3828	DUCK CREEK
B8			K3829	DUCK CREEK
B8			K3830	DUCK CREEK
B8			K3831	DUCK CREEK
B8			K3832	DUCK CREEK
B8			K3833	DUCK CREEK
B8			K3834	DUCK CREEK
B8			K3835	DUCK CREEK
B8			K3836	DUCK CREEK
B8			K3837	DUCK CREEK
B8			K3849	DUCK CREEK
B8			K3850	DUCK CREEK
B8			K3851	DUCK CREEK
B8			K3852	DUCK CREEK
B8			K3853	DUCK CREEK
B8			K833	LITTLE CREEK
B8	C6		K238	DUCK CREEK
B8	X3	X4	K3163	LITTLE CREEK

APPENDIX II (cont.)
STANDING STRUCTURE CULTURAL RESOURCES IN THE
ROUTE 13 PROJECT ALIGNMENTS, ARRANGED BY HIGHWAY SEGMENTS

			CRS	HUNDRED
C1	B5		N5857	APPOQUINIMINK
C10			K909	EAST DOVER
C3	B6		N5938	BLACKBIRD
C4			K202	DUCK CREEK
C4			K4012	DUCK CREEK
C4			K4013	DUCK CREEK
C4			K4014	DUCK CREEK
C4			K4015	DUCK CREEK
C4			K4016	DUCK CREEK
C4			K4017	DUCK CREEK
C4			K4018	DUCK CREEK
C4			K4019	DUCK CREEK
C4			K4020	DUCK CREEK
C4			K4021	DUCK CREEK
C4			K4022	DUCK CREEK
C4			K4023	DUCK CREEK
C4			K4024	DUCK CREEK
C4			N132	BLACKBIRD
C4			N4246	BLACKBIRD
C5			K3938	DUCK CREEK
C5			K3939	DUCK CREEK
C5			K3940	DUCK CREEK
C8			K2063	LITTLE CREEK
C8			K2064	LITTLE CREEK
C8			K2065	LITTLE CREEK
C8			K2066	LITTLE CREEK
X1			N5879	APPOQUINIMINK
X3			K1613	LITTLE CREEK
X3	A5		K1344	KENTON
X3	X4	B8	K3164	LITTLE CREEK

CULTURAL RESOURCE MANAGEMENT OVERVIEW OF THE PROPOSED ROUTE 13 CORRIDOR

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The purpose of this overview is to provide a summary of the cultural resources management data for the proposed Route 13 corridor. Because other essays have dealt specifically with the three main classes of cultural resources (prehistoric archaeological sites, historic archaeological sites, and standing structures), this overview will solely consider the types of resources (and their potential significance) that are present or may be expected to be present within the data link segments of the proposed alignments.

Table 4 provides a listing of the basic data on cultural resources that are available for each of the data links. The prehistoric high probability zone percentage figures provide a guide to those areas that are most likely to contain sites which would be eligible for listing on the National Register of Historic Places. These significant sites would require Phase III data recovery excavations if avoidance or preservation-in-place were not feasible mitigation alternatives. The high probability

TABLE 4: ROUTE 13 CULTURAL RESOURCE MANAGEMENT DATA SUMMARY

DATA LINK	PREHIST. HIGH PROB. PERCENT.	HIST. ARCH. SITE COUNT	P.-1802 HIST. ARCH. PROB.	STAND. STRUC. COUNT	CULTURAL RESOURCE MANAGE. SCORE
A1	0	13	80	29	13
A1.1	0	0	10	0	4
A2	18	2	0	14	7
A3	0	0	0	4	5
A4	13	1	30	20	8
A5	0	0	10	7	6
A6	8	1	0	8	6
A7	25	0	25	4	5
A8	15	1	10	37	7
A9	51	1	40	22	10
A9.1	100	0	0	5	8
B1	0	7	50	5	8
B10	35	6	100	0	9
B11	100	0	50	0	8
B12	100	0	50	0	8
B13	18	0	0	24	7
B14	100	0	0	4	8
B15	0	0	20	8	6
B16	100	0	100	0	10
B17	83	0	100	0	10
B18	83	0	100	1	10
B19	7	0	100	10	10
B2	0	27	100	28	13
B3	0	1	100	1	7
B4	31	2	100	1	8
B5	17	6	100	17	11
B6	0	10	0	8	9
B7	0	5	100	8	10
B8	6	3	100	22	9
B9	14	9	100	0	9
C1	0	1	90	3	6
C10	27	2	30	0	6
C11	100	0	80	0	10
C2	0	0	80	1	7
C3	7	5	20	4	6
C4	1	60	17	0	7
C5	0	0	50	3	4
C6	10	0	40	1	5
C7	25	0	100	0	7
C8	0	0	60	6	7
C9	18	0	50	0	5
X1	6	22	10	6	8
X2	13	1	20	0	4
X3	13	0	10	6	5
X4	25	1	20	9	6

zones would also require the greatest number of Phase II determination-of-eligibility testing projects. The counts of historic archaeological sites represent known sites that will definitely require Phase II testing. Many will probably also require Phase III data recovery excavations if avoidance or preservation-in-place are not feasible mitigation alternatives. The listing of pre-1802 historic archaeological probability zone percentages are similar to those noted for prehistoric sites in terms of required archaeological survey and excavation. The counts of standing structures primarily refer to the number of projected secondary (visual) effects of the project that will have to be mitigated.

In order to rank the individual data links a scoring system was developed. Table 5 lists the scoring system used. A composite score, which is proportional to cultural resource sensitivity, was calculated by summing the individual scores for each cultural resource type. The composite score is listed in Table 4 and can be used to rank the data links by their cultural resource sensitivity. Table 6 shows the projected sensitivity categories and their composite data links. Figures

TABLE 5: CULTURAL RESOURCE SENSITIVITY SCORING SYSTEM

Prehistoric and Historic Sensitivity Percentages		Historic Archaeological and Standing Structure Counts	
%	Score	Count	Score
0-25	1	0-3	1
26-50	2	4-6	2
51-75	3	7-9	3
76-100	4	>9	4

TABLE 6: DATA LINKS BY SENSITIVITY CATEGORIES

High Sensitivity Category (CRM score >9)

A1, A9, B16, B17, B18, B19, B2, B7, C11

Medium Sensitivity Category (CRM score >4, <10)

A2, A3, A4, A5, A6, A7, A8, A9.1, B1, B10, B11, B12, B13, B14, B15, B3, B4, B6, B8, C1, C10, C2, C3, C4, C6, C7, C8, C9, X1, X3, X4

Low Sensitivity Category (CRM score <5)

A1.1, C5, X2

7-9 show the distribution of sensitivity categories and it can be seen that neither alternative is prefeered for minimizing the effect of the project on cultural resources. While the western alignment data links are likely to contain more significant prehistoric archaeological sites, the eastern alignment data links are likely to contain more significant standing structures and historic archaeological sites. To reiterate, given the present level of information, neither alignment is preferred.

FIGURE 7

Sensitivity Categories – Odessa Segment

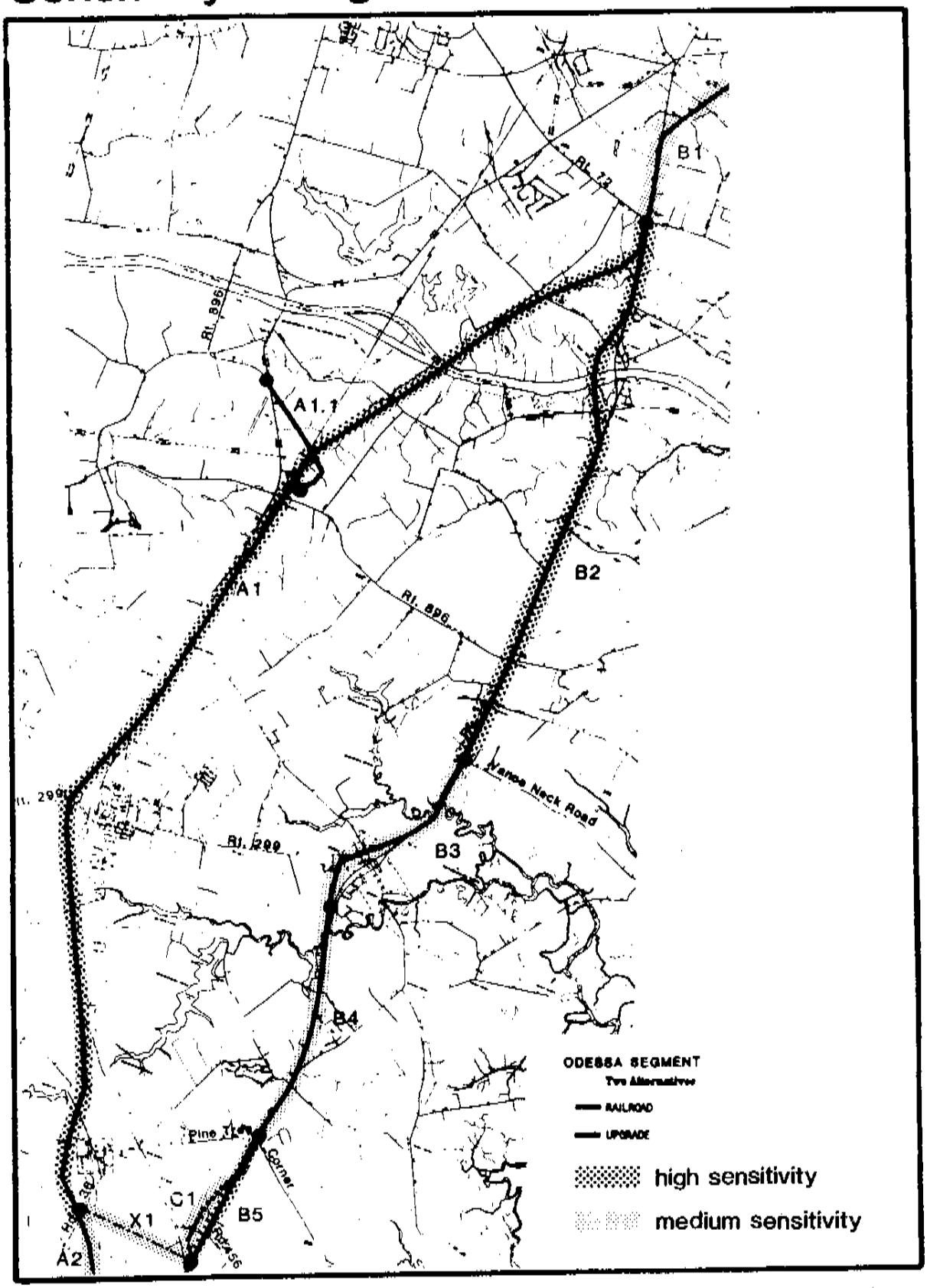


FIGURE 8

Sensitivity Categories – Smyrna Segment

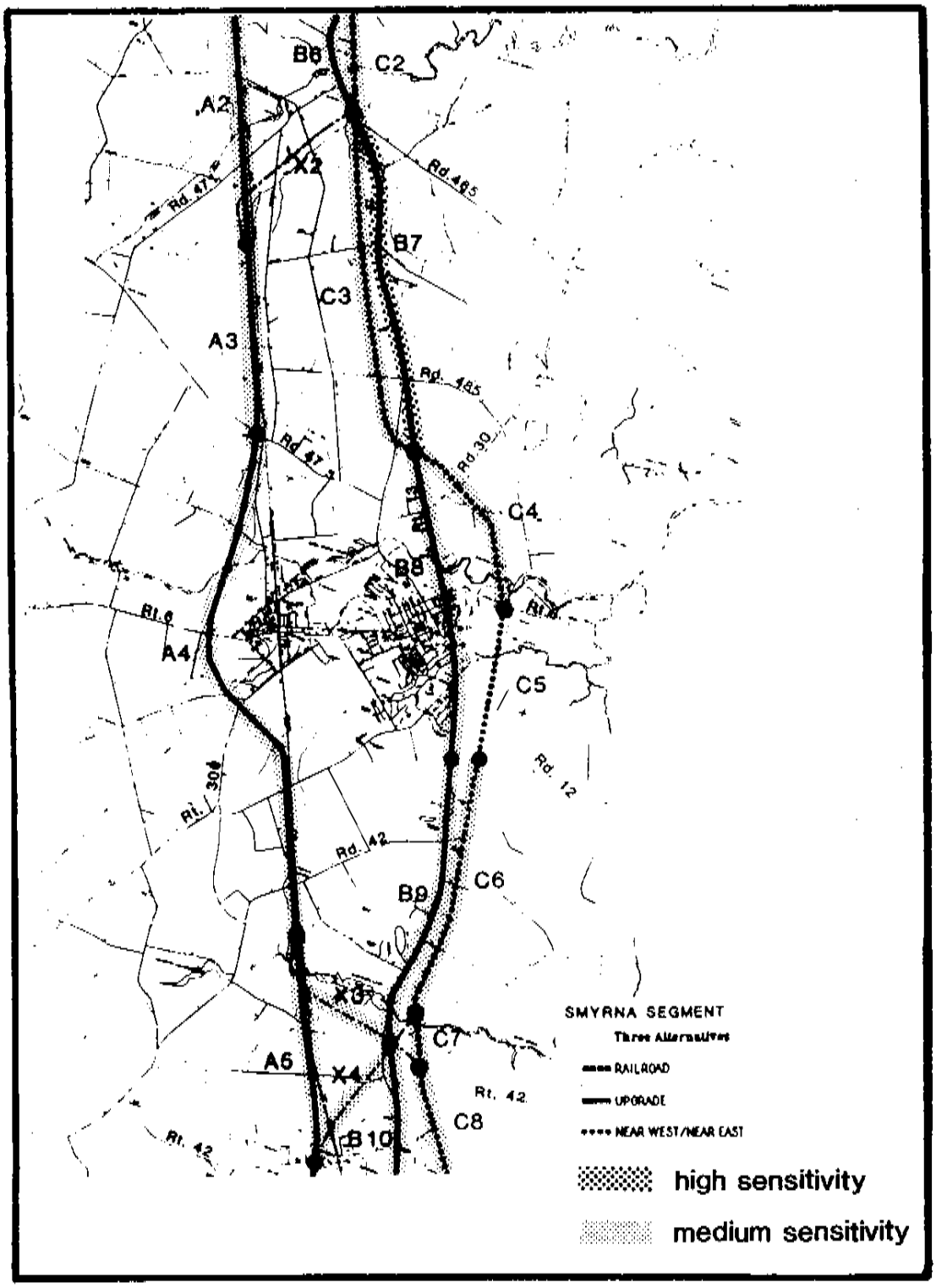
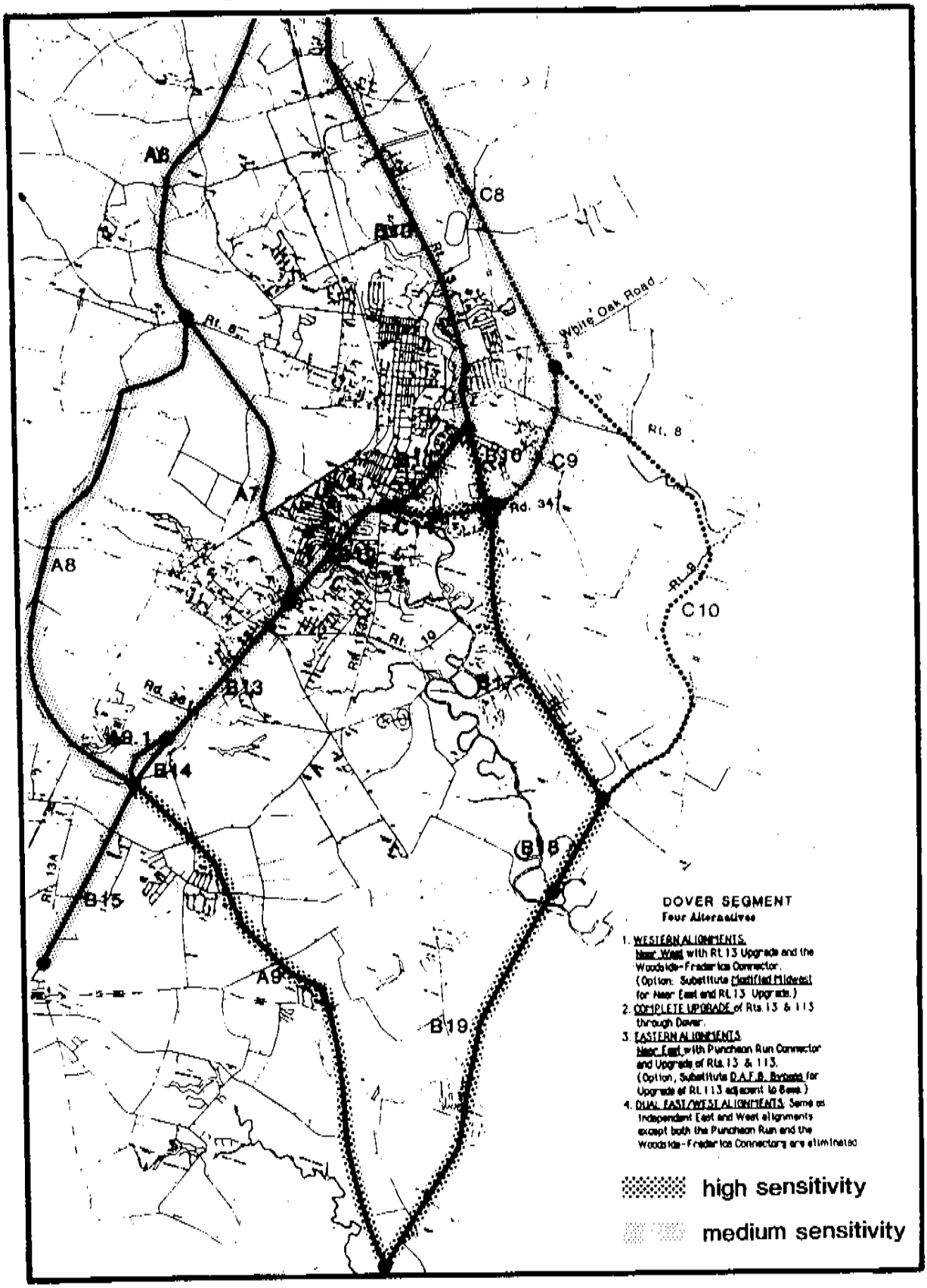


FIGURE 9

Sensitivity Categories – Dover Segment



FINAL DRAFT

MEMORANDUM OF AGREEMENT

FOR THE PROPOSED U.S. 13 RELIEF ROUTE CORRIDOR

KENT AND NEW CASTLE COUNTIES, DELAWARE

F-1001(16) 83-110-01

OCTOBER, 1985

Note: This MOA has been reviewed and commented on by the Delaware DOT, Delaware SHPO, FHWA and Advisory Council on Historic Preservation. All comments received have been incorporated into this MOA. Agency comments are attached at the end of the MOA. Final signatures are being requested and should be received in November 1985.

FINAL DRAFT

MEMORANDUM OF AGREEMENT

FOR THE PROPOSED U.S. 13 RELIEF ROUTE CORRIDOR

KENT AND NEW CASTLE COUNTIES, DELAWARE

WHEREAS, the Federal Highway Administration, U.S. Department of Transportation (FHWA), in consultation with the Delaware State Historic Preservation Officer (SHPO), has determined that the construction of the proposed U.S. Route 13 Relief Route may have an adverse effect upon properties, structures and historic and prehistoric archaeological sites included in or eligible for inclusion in the National Register of Historic Places and will continue to request the comments of the Advisory Council on Historic Preservation (ACHP) pursuant to Section 106 (and Section 110f) of the National Historic Preservation Act (16 U.S.C. 470) and its implementing regulations, "Protection of Historic and Cultural Properties (36 CFR Part 800)"

WHEREAS, pursuant to the procedures of the ACHP (36 CFR Part 800), representatives of the Delaware Department of Transportation (DelDOT), an invited participant in the consultation process, the FHWA and the DelSHPO will consult and review the undertaking to consider prudent and feasible alternatives to avoid or satisfactorily mitigate the adverse effect; and,

WHEREAS, pursuant to the procedures of the ACHP (36 CFR Part 800), representatives of the FHWA, the DelDOT, and the DelSHPO have and will continue to consult;

NOW THEREFORE, the FHWA, DelDOT, DelSHPO and ACHP agree that the planning for all cultural resources within the proposed Rt. 13 Relief Route corridor will be accomplished in accordance with the following procedures in order to take into account the effect of the proposed project on cultural resources.

1.0 Identification of Resources

DelDOT, in consultation with the DelSHPO has undertaken and will complete a Phase I and II archaeological, historical and architectural survey of the proposed Rt. 13 Relief Route corridor. This survey has and will continue to be performed in accordance with Appendix B of 36 CFR Part 66 ("Guidelines for the Location and Identification of Historic Properties Containing Scientific, Prehistoric, Historical, or Archaeological Data") and has and will continue to result in the location and identification of all properties within the proposed Rt. 13 Relief Route corridor which are or appear to be eligible for listing in the National Register of Historic Places under Criteria A, B, C, and/or D.

2.0 Evaluation of Significance

DelDOT, in consultation with the DelSHPO and FHWA, will apply the National Register Criteria (36 CFR 60.6) to all sites and properties which have been and will be identified in the

proposed Rt. 13 Relief Route corridor. The FHWA will submit the results of these consultations to the Keeper of the National Register in the form of Determinations of Eligibility pursuant to 36 CFR 63.3 for those properties that will be affected by the proposed project.

3.0 Determination of Effect

DelDOT will, in consultation with the FHWA and DelSHPO, determine the effect of the proposed undertaking for each National Register listed or eligible property or site identified in Section 2.0 above in accordance with ACHP procedures (36 CFR 800.3).

4.0 Mitigation Measures

Cultural properties, sites and structures, that are determined eligible under Section 2.0 above and which may be adversely affected by the proposed project as identified in Section 3.0 above will be treated in accordance with the following stipulations in order to minimize any identified adverse effect.

4.1 General Measures

During the development of all stages of route selection and design, a reasonable effort will be made to locate the proposed new alignment and structures away from affected sites, structures and properties so as to avoid adverse effects. Agreement on

final alignment selection will be subject to DelSHPO and ACHP review and comments.

4.2 Archaeological Resources

If efforts to avoid significant archaeological sites or properties during the final planning and design of the proposed project are not prudent or feasible, preservation in place is not feasible, and the effect on these resources remains adverse, DelDOT will develop, in consultation with the DelSHPO and FHWA, data recovery plans for each site or class of sites so affected. All data recovery plans will include research design, budgets and schedules for completion prior to construction and will be otherwise in conformance with the ACHP "HANDBOOK" and subject to FHWA approval and ACHP and DelSHPO review and comment.

4.3 Historical/Architectural Resources

If efforts to avoid direct or indirect adverse effects on significant historical/architectural structures or properties during the final planning and design of the proposed project are not prudent or feasible, DelDOT and FHWA shall develop mitigation plans for each district, site or property so affected. These plans will be subject to DelSHPO and ACHP review and comment. These plans may include, but not be limited to any combination of the following measures as appropriate:

4.3.1 Moving the structure(s) and marketing for resale.

4.3.2 Recordation of the structure(s) in accordance with the standards of the Historic American Building Survey or the Historic American Engineering Record.

4.3.3 Landscaping to provide visual screens and/or noise barriers.

4.4 Completion of Mitigation

DelDOT and FHWA will ensure that all mitigation measures are completed and reports or other documentation agreed to by DelSHPO and ACHP prior to the demolition, alteration, substantial deterioration and/or transfer of the affected site or property.

5.0 Reporting Standards

Draft and Final Survey reports and reports or other documentation that may result from any projects to mitigate adverse effects of the proposed undertaking will be prepared in accordance with the professional standards outlined in the ACHP "Guidelines for the Preparation and Evaluation of Archaeological Reports" and the DelSHPO's "Guidelines for Cultural Resource Reports Submitted to the Bureau of Archaeology and Historic Preservation." Any recordation of buildings or structures will be accomplished in conformance with HABS and HAER standards. These reports and documents will be subject to the review and approval of the DelSHPO and will be submitted as final prior to the completion of construction. Copies of the final reports will be distributed to all MOA signatories and all other interested parties to be determined by DelDOT, FHWA, and DelSHPO. A Public Summary Report detailing the prehistory, history and architectural resources of the Rt. 13 Relief Route corridor will

be prepared and made available for general distribution prior to the completion of construction.

6.0 Professional Qualifications

DelDOT and FHWA shall ensure that all historic architectural, and archaeological work pursuant to this Memorandum of Agreement is carried out by or under the direct supervision of a person or persons meeting at a minimum, the appropriate qualifications set forth in the Department of the Interiors "Professional Qualifications."

7.0 Public Participation

As it can be accomplished, every effort will be made to provide for public participation in the cultural resource survey's and data recovery projects, if any, during the planning and construction phases of the Rt. 13 Relief Route project.

8.0 Dispute Resolution

If at any time during the execution of the terms of this Memorandum of Agreement, a conflict or objection arises that cannot be resolved by the FHWA, DelDOT and DelSHPO, the conflict

or objection may be brought to the ACHP for review and comment. FHWA will take into account the comments of ACHP in reaching a final decision.

FHWA, Delaware Division Administrator _____ Date

DelDOT, Director, Division of Highways _____ Date

DelSHPO, State Historic Preservation Officer _____ Date

ACHP, Executive Director _____ Date

ACHP, Chairman _____ Date